THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

VOL. VI. No. 113—9th YEAR.] LONDON, FEBRUARY 17, 1857. [Subscription per Ann. { 15s. in Advance / 18s. Credit.] Price 8d. Unstamped.

FIRE-CLAY Retorts and Fire Goods.
The Advertiser has brought his Fire-Clay Retorts to great perfection, both as to quality and finish. Many have stood three and four years.
Every description of Fire Goods in any quantity always on hand. The Fire Clay is the very best in the North of England. Stock never less than 10,000 tons weathering.
Orders promptly executed.
Apply, G. H. RAMSAY, of Derwenthaugh Fire-Brick Works, near NEWCASTLE-ON-TYNE.
Aug. 22, 1856.

TO IRONFOUNDERS & GASHOLDER MAKERS.
PRESTON GAS-WORKS.

THE Directors of the Preston Gas COMPANY are willing to receive TENDERS for a Double, or Telescopic GASHOLDER, 75 feet diameter, with suitable Suspension Frame and Apparatus.
Also, for about 2000 yards of PIPES, of 10, 12, and 14 inches diameter.
Plans may be seen, and Specifications had, on application to the ENGINEER of the Company, PRESTON, on or after Thursday, the 12th of February.
Tenders must be delivered at the Company's Office, in Preston, on or before Saturday, the 28th day of February instant; but the Directors will not consider themselves bound to accept the lowest Tender.
JOHN ROPE, Engineer.
Preston, Feb. 7, 1857.

TO GAS ENGINEERS.

WANTED, in a Provincial Town, an ENGINEER, capable of undertaking the sole charge of a Gas-work. He will be required to reside at the Works.
For particulars of the duties, salary, &c., inquire at the Office of the Town Clerk, No. 1, Friar Street, Reading.
Testimonials as to competence, respectability, &c., will be required.
Applications to be addressed to J. J. BLANDY, Town Clerk, READING, on or before Saturday, the 21st inst.
Reading, Feb. 6, 1857.

PORTSMOUTH.—GAS-WORKS TO BE LET.

THE Portsea Island Gaslight Com- PANY will be prepared (on or before the 1st day of May next) to receive TENDERS for the MANUFACTURE of GAS for supplying the said Island from and after the 30th of June next.
The Works are most conveniently situated, and, being close to the water's edge, afford every facility for taking in Coals, &c.
A copy of the proposed Contract and Conditions may be seen at the Company's Office, PORTSEA, and all particulars obtained, in the first instance by letter, on and after the 20th of March next.
By order of the Committee of Management,
JAMES F. ABSOLOM,
Clerk to the said Company.
Gas Office, Portsea, Feb. 14, 1857.

COWEN'S PATENT FIRE-CLAY RETORTS.
JOS. COWEN and CO.,
BLAYDON BURN, NEAR NEWCASTLE-ON-TYNE.
Were the only parties to whom a PRIZE MEDAL was awarded at the GREAT EXHIBITION of 1851, for "GAS RETORTS and OTHER OBJECTS in FIRE CLAY."
J. C. and Co. have been for many years the most extensive Manufacturers of Fire Clay Retorts in the United Kingdom; and orders for Fire Clay Retorts of all shapes and dimensions, Fire Bricks, and every other article in Fire Clay, are promptly executed at their works as above.
COWEN'S GARESFIELD COAL AND COKE.
Coal and Coke Office,
QUAY SIDE, NEWCASTLE-ON-TYNE.

FIRST PRIZE IN THE PARIS EXHIBITION.

JOHN RUSSELL AND CO.,
THE OLD TUBE WORKS,
CHURCH HILL, WEDNESBURY, STAFFORDSHIRE,
and 69, UPPER THAMES STREET, LONDON,
Original Manufacturers of Wrought-Iron Gas Tubes, and Holders of the present Patents; Inventors and First Makers of LAP-WELDED FLUES for Steam Boilers.
J. R. and Co. make all kinds of Tubes and Fittings for Gas, Steam, and Water, and the largest Orders may be executed in a few days.
The eminent Engineer, Mr. Perkins, confines himself altogether to the use of John Russell and Co.'s Tubes in his High-Pressure Steam Patents.
Gun Metal, and all other kinds of Cocks, Stocks, Dies, and Taps, Galvanised Tubes, &c.
N.B. All Goods thoroughly Tested before sent out, and Warranted.

TO GAS CONTRACTORS.

WANTED, by a Respectable Young Man, an ENGAGEMENT, either on the Continent or in the Colonies. Understands the Gas-fitting and Brass-finishing in all its branches, and would be zealous in the discharge of his duties. Satisfactory references can be given.
Address by letter, with particulars, post paid, to A. Z., 3, Salisbury Court, Fleet Street, LONDON (E.C.).

BLAYDON BURN AND LOW BENWELL FIRE CLAY RETORT AND FIRE-BRICK WORKS, NEAR NEWCASTLE-ON-TYNE.

WILLIAM COCHRAN CARR,
begs most respectfully to thank the Metropolitan, Provincial, and Continental Gas Companies for their patronage for several years past, and to intimate that he has rebuilt and enlarged his extensive premises for the Manufacture of CLAY RETORTS; and that he is now prepared to execute the largest orders with punctuality and despatch. Orders for FIRE-CLAY RETORTS, of all shapes and sizes, FIRE-BRICKS, and all other Articles in Fire-Clay, executed on the shortest notice and on the most reasonable terms.
London Agents:
JAMES LAWRIE & CO.,
63, OLD BROAD STREET, CITY, LONDON.

SECOND-HAND APPARATUS.

WANTED, by a Gas Company in South Wales, a STATION METER, Four Dry PURIFIERS, CONDENSERS, SCRUBBER, and EXHAUSTER, each to be equal to pass and purify 15,000 feet of gas per hour.
Also, an Eight-horse power ENGINE, and suitable BOILER. The whole must be in good condition, and of modern construction.
Full particulars, with lowest price, to be addressed, S. G. C., care of T. G. BARLOW, Esq., 3, Parliament Street, LONDON.

TO GASHOLDER MAKERS AND OTHERS.

THE Charlotte Town Gaslight Com- PANY are prepared to receive TENDERS for the supplying and fixing complete on their Works, at Charlotte Town, Prince Edward Island, North America, a Cast-iron TANK, 48 feet in diameter and 18 feet deep; also, a GASHOLDER, to work in same, with Brackets, Rollers, &c., all complete.
The Tenders to be separate, and accompanied with Plans and Specifications.
The Contractor will have to find all Scaffolding, &c., that he may require.
The Company will not bind themselves to accept the lowest or any Tender.
Parties wishing to Tender for either or both the foregoing can obtain all information they may require respecting freight, sailing of ship, &c., of ANDREW DUNCAN, Esq., 12, Baltic Buildings, Red Cross Street, LIVERPOOL.
The successful applicant will have to ship all materials on or about the 1st day of October next, or any other time Mr. Duncan may direct.
Tenders to be addressed to me, at the Charlotte Town Gas-Works, P. E. Island, North America, and must be mailed in England forthwith.
WM. MURPHY, Superintendent.
Charlotte Town, Jan. 19, 1857.

MR. WILLIAM RICHARDSON,
CONSULTING ENGINEER,
DUDLEY.

JAMES RUSSELL AND SONS,

WEDNESBURY, STAFFORDSHIRE, and 81, UPPER GROUND STREET, BLACKFRIARS, LONDON,
PATENTEES, INVENTORS, AND FIRST MAKERS OF
WROUGHT-IRON GAS TUBING,
commencing from the *earliest* introduction of Gas Lighting into this country.
Manufacturers of every size and description of Wrought-iron Tubes and Fittings, from one-eighth up to seven-inch internal diameter, for Gas, Steam, or Water.
PATENTEES AND MANUFACTURERS OF THE
LAP-WELDED FLUES,
for Marine, Locomotive, and Stationary Boilers.
Inventors and Manufacturers of
IMPROVED STEAM AND GAS COCKS,
in Iron or Gun Metal, from three-eighths to six-inch bore. Manufacturers of every description of hand-screwing
STOCKS, DIES, AND TAPS,
for Gasfitters and Engineering purposes.
Manufacturers of Coils, for hot water and other purposes; Casing of all sizes, with flush joints, for Well-sinkers; Blasting Tubes; Buffer Tubes for Railway Carriages; Tubes for Roller Beams; Spindles, Shafts, Pendulums, Hydraulic Presses, Core Bars, Steam Gauges, &c. &c.
JAMES RUSSELL and SONS beg to call the attention of Engineers, Builders, Water Companies, and others, to their
PATENT ENAMELLED TUBES,
which preserve water or other liquids conveyed by them in a perfectly limpid condition; whilst the Enamel itself is as pure as the finest Porcelain, possessing the rare recommendation of being entirely free from any noxious ingredient in its composition.
Lists, Estimates, &c. &c., forwarded on application; orders, from 10 to 100,000 feet of gas tube, executed at twelve hours' notice if required; and quality may be safely relied upon, as all goods are most carefully tested before leaving the Works.
JAMES RUSSELL and SONS have great pleasure in calling attention to the annexed award:—
"EXHIBITION OF THE INDUSTRY OF ALL NATIONS, NEW YORK.
"Office: No. 6, Charing-cross, London, April 6, 1854.
"Gentlemen,—I have much pleasure in informing you that the Jury has awarded to your firm 'HONOURABLE MENTION FOR LAP-WELDED IRON TUBES.' You are at full liberty, if you deem it likely to promote your mercantile advantage, to affix to these articles, during the season 1854, a card whereon this Award is printed, and also your prices, with name of agent, &c.—I am, gentlemen, your obedient servant,
"Messrs. JAMES RUSSELL and SONS, Wednesbury, STAFFORDSHIRE."
"JOHN H. BOHN, Secretary.

By Her Majesty's Royal Letters Patent.

JAMES MEACOCK,

MANUFACTURER OF

PATENT DRY AND IMPROVED WET METERS,

Also of every Description of Apparatus used in the Gas Factory, as well as in Gas Distribution.

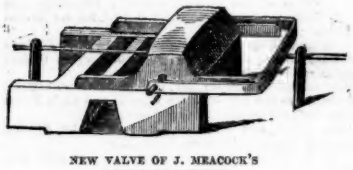
7, SNOW HILL, & GILTSPUR STREET, LONDON.

Established 1836.

PATRONISED BY ALL THE GAS COMPANIES OF THE METROPOLIS, AS WELL AS MOST OF THE PROVINCIAL TOWNS.

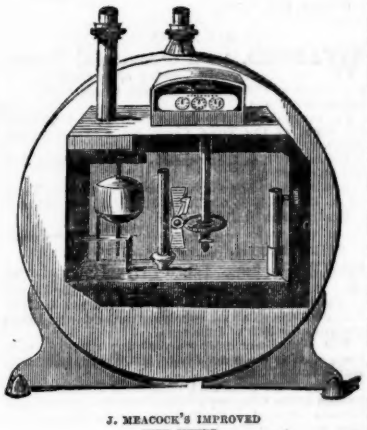
J. MEACOCK, in returning thanks for the liberal favours he has received, most respectfully calls the attention of those interested in Gas Lighting to the improvements of his DRY METER, which has obtained HER MAJESTY'S ROYAL LETTERS PATENT, and which contains all the desired requisites for simplicity, durability, and faithful registration; also to his improved WET GAS-METER, which all the leading Gas Companies have been pleased to patronise; and begs to solicit the continuance of their commands for the above, as well as *Experimental and Station-Meters*, Pressure-Indicators, Governors, Gauges, Photometers, and every apparatus in use by the Gas Engineer, which he will warrant of the very best materials and workmanship, and at most economical charges.

J. MEACOCK'S PATENT DRY METER.



NEW VALVE OF J. MEACOCK'S PATENT DRY METER.

OLD VALVE OF THE ORDINARY DRY GAS-METER.



J. MEACOCK'S IMPROVED WET METER.

In the above Diagrams of Meters will be seen J. MEACOCK'S patent method of securing the Leather Diaphragm of his IMPROVED PATENT DRY METER. Instead of using the soldering iron for the purpose, by which the Leather is more or less injured, it is held between two flat Metal Rings, and screwed up sound on to a frame to receive it, the outward rim of which and screw-heads are shown in the drawing.

The Valve adopted in the above Patent Meter is also shown, as well as the ordinary Slide-Valve; the advantages of the former in not rising from its facing will be very apparent to the practical Gas Engineer, to whom it is of vital import.

WET GAS-METERS REPAIRED AND RECONSTRUCTED WITH J. MEACOCK'S MODERN IMPROVEMENTS.

J. MEACOCK begs leave most respectfully to submit to the notice of Gas Companies his PATENT DRY GAS-METER, trusting thereby to receive the same encouragement that has been so kindly awarded him in respect of his Improved Water Meter, which has been patronised by all the Metropolitan Companies, as well as most of the Provincial Gas-works.

The public having been induced to desire Dry Gas-Meters in preference to Wet, and many Gas Companies being willing to yield to their wishes, if a correct measurer, not liable to fluctuation of registry, of good materials and workmanship, and when repair was necessary, of being put in order by simple means, J. M. has been induced to apply himself to the production of a Dry Meter, possessing those requisites, for which he has obtained her Majesty's Royal Letters Patent.

It is not generally known, but very frequently in fitting up the ordinary Dry Meter, the leather of the diaphragm is destroyed during the process of soldering, by coming in contact with the hot soldering iron. In his present process, J. M. has done away with its use, no solder being necessary, the leather being secured by two flat metal rings, between which it is screwed, rivetted, or overlaid; the perishing effect of hot tools to leather being avoided, its durability must be longer; also, by this means, its repair when needful is most simple, as a new leather diaphragm can be applied by merely unscrewing the old one from the rim or frame to which it had previously been screwed up sound.

In the ordinary Dry Meter frequent variations of registry have been detectable from defective valves, which tilt or rise from their facings: the slide-valve of this Patent Dry Meter will not allow any carbonaceous matter common to coal gas to tilt or lift the slide from its facings, and hence no variation. It will be found not only a correct measurer, but free from fluctuation.

The heavy wear and tear to which the Meters of Gas Companies are subject, have at all times made it desirable to have them of the best materials and workmanship. Unfortunately, in the greater number of the ordinary Dry Meters, neither of these requisites were carried out, for, as they were not to contain water, most inferior workmen and materials were employed in their construction. J. M. begs leave to assure those who may honour him with their commands, that nothing but the stoutest materials for cases, the hardest gas-resisting metals, and best foreign leather for the interiors, will be used, and none but first-class workmen employed in their construction (the properties which his Improved Water Meter is well known to possess, and which has obtained him that extensive patronage), will be strictly carried out in his PATENT DRY METER.

In respect of any orders with which he may be honoured, he is willing to give a stamped guarantee to keep the same in repair, *free of all charge*, for five years, and allow the customary discount off the original list price.

J. M. has annexed diagrams of his Patent Dry, also of his Improved Wet, Gas-Meter. In the former will be seen his patent mode of securing the diaphragm. The former and present valve are also shown, and the advantages of the latter will be, by practical persons, easily understood.

METERS SENT ON APPROVAL.

DINAS FIRE BRICKS, RETORTS, AND CEMENTS.

YOUNG & ALLEN,

MANUFACTURERS OF DINAS FIRE BRICKS AND RETORTS,

NEATH, GLAMORGANSHIRE,

Beg to draw the attention of the Engineers and Managers of Gas-works to the superior quality of their goods, and more especially to their BRICK RETORTS, which, in addition to the almost infusible nature of the Fire-Clay employed, have the great advantage, from its large excess of Silica, of EXPANDING BY THE APPLICATION OF HEAT, and consequently becoming sounder and less liable to leak by use. Their cost is less than that of the ordinary Clay Retorts.

Young and Allen's DINAS FIRE-BRICKS and CEMENT have been long used for the linings of furnaces exposed to high temperatures, and are well known in the London and other Gas-works. They can be forwarded by rail to all parts of the United Kingdom, and shipped by sea to all parts of the world.

Prices on application as above.

S. & E. RANSOME & CO.,

31, ESSEX STREET, STRAND, LONDON (W.C.),

beg to call attention to their

GAS HEATING & COOKING STOVES.

Price, from 18s. 6d. each, and upwards.

WHOLESALE AGENTS FOR

MEAD'S PATENT DRY GAS-REGULATORS, GODDARD'S DUPLEX & ECONOMIC BURNERS, GAS BATHS, HEATING COILS, TORCHES, &c.

Also,

GWYNNE'S STEAM-PRESSURE GAUGES, and JOHNSTON'S PATENT ALARM WHISTLES, for preventing Explosions in Steam-Boilers.

Drawings and Prices sent on application.

SMALL TELESCOPE GASHOLDERS AND TANKS FOR SALE.

FOR SALE, in good condition, three Cast-Iron TANKS, 34 feet diameter by 20 feet deep, with TELESCOPE GASHOLDERS, complete, with the exception of Guide Columns and Framing; and One TELESCOPE GASHOLDER, 33 feet diameter and 20 feet, deep, without Columns or Framing.

Also a quantity of Mouthpieces, Retort Lids, Hydraulic Mains, and other Castings.

To be seen, and all particulars obtained, on application to the SUPERINTENDENT, Chartered Gas Company, Horseferry Road, WESTMINSTER.

SECOND-HAND STATION-METERS.

CHARLES BOTTEN and SON, having lately exchanged some STATION-METERS (in good condition) for larger ones, will dispose of them on most reasonable terms. C. B. and SON would also call the attention of all buyers to their new tariff for Consumers' Meters. CHARLES BOTTEN and SON, Engineers and Manufacturers of Gas Meters, Fittings, and all Gas Apparatus, Crawford Passage, Ray Street, Clerkenwell, LONDON.

GAS COMPANIES

supplied with all the WORKING GAS BOOKS, GAS FORMS, &c., on the shortest notice. Also, SHARE CERTIFICATES and COMMON SEALS prepared in the best manner for all New Companies, by

CHARLES & ALFRED DOUBBLE,

REGISTRATION AGENTS,

LAW, PUBLIC COMPANIES, & MANUFACTURING STATIONERS,

14 and 15, SERJEANTS' INN, FLEET STREET, LONDON.

N.B.—List of Books, &c., sent post free on application.

WILLIAM STEPHENSON & SON,

THROCKLEY,

NEWCASTLE-ON-TYNE,

MANUFACTURERS OF EVERY DESCRIPTION OF

FIRE BRICKS, CLAY RETORTS, LUMPS, TILES,

&c. &c.

LONDON OFFICES:

76, KING WILLIAM STREET, CITY.

GAS ENGINEERING OFFICES,

104, LEADENHALL STREET, LONDON.

I beg to inform my business friends that I have removed my offices to the above address, where I shall be happy to see them on all matters connected with the profession.

Thanking many gentlemen for their use and recommendation of my Exhausters, Valves, &c.,

I am, &c. GEORGE ANDERSON.

MR. JONES begs to intimate to the Directors and Shareholders of Gas Companies, that he can be consulted on the most efficient modes of keeping the accounts of Gas Companies, whereby their accuracy may readily be proved; and that he is also open to be engaged as a Professional Auditor.

ANDERSON and JONES, Lessees of Gas-works, DOVER.

HARRIS AND PEARSON,

PROPRIETORS OF

BEST CLASS-HOUSE POT AND CRUCIBLE CLAY

MANUFACTURERS OF

FIRE BRICKS GAS RETORTS, &C.

AMBLECOTE FIRE CLAY AND BRICK WORKS, STOURBRIDGE.

Late in the occupation of I. and W. King. Originally J. Pidcock, Esq.

CROSLEY & CO.,

GAS METER MANUFACTURERS,

103, SOUTHWARK BRIDGE ROAD,

LONDON,

SOLE LICENCEES AND MANUFACTURERS OF

W. CROSLEY'S AND CROSLEY & GOLDSMITH'S

PATENT STANDARD SELF-ADJUSTING AND COMPENSATING GAS METERS,

by which the True Water-Line is constantly maintained, and accuracy of measurement at all times secured.

Manufacturers of LOWE'S PATENT MOTIVE-POWER METER, for situations where there is an inadequacy of pressure to supply the special requirements of certain consumers in low grounds during the day or night.

Also, Manufacturers of EXPERIMENTAL METERS, GASHOLDERS, GOVERNORS, MINUTE-CLOCKS, PHOTOMETERS, &c. &c., similar to those used by Mr. King, of Liverpool.

C. and Co. continue to manufacture ordinary WET METERS of the very best description, Mr. W. Crosley having been for many years the principal and confidential assistant of his relative, the late Mr. Samuel Crosley, of Cottage Lane, City Road, up to the time of his decease, in which capacity he communicated to W. C. the secret of the mixture of the metals which has rendered the Crosley Meter so durable and superior to all others, as is evidenced by a large number of them being still at work, after having stood the test of nearly a quarter of a century's use.

TO IRON-FOUNDERS AND CONTRACTORS.

THE Directors of the Cork Gas Con- SUMERS' COMPANY are prepared to receive TENDERS for the supply of about 40 miles of turned and bored and common SOCKET-PIPES, from 14 in. to 3 in. in diameter, together with Syphons, Bends, Branches, &c., and the usual apparatus necessary to the Manufacture of Coal Gas.

Drawings and Specifications may be seen at the Offices of Mr. George Anderson, 104, Leadenhall Street, London, from the 19th to 25th of the present month.

The Company do not bind themselves to accept the lowest Tender; and the successful Contractor must execute a Contract, and provide satisfactory security for the proper carrying out of his Contract.

Tenders, endorsed "Tenders for Gas Apparatus," to be sent to the Offices of the Company, 45, South Wall, CORK, on or before the end of the present month.

DENNY LANE, Secretary.

PATENT FIRE-CLAY RETORTS.— O. BROTHERS and COMPANY, Manufacturers of O. Brothers's Patent, beg to state that these Retorts, being made in one entire operation, and in one piece, of any required shape, length, breadth, and height, are not liable to cracks and fissures, of which there is a just and general complaint; and consequently superior to, and cheaper than, any hitherto manufactured.

GREAT REDUCTION IN PRICES—30 per cent. cheaper than any other Clay Retorts manufactured.

Shape.	Sizes.	Length.	Thickness.	Price at Railway Station, Blackburn.	Price per foot run, of any required length, at Blackburn.
		feet.	in.	£ s. d.	s. d.
Dee.....	12 in. by 12 in.	8	2½	2 0 0	5 0
,, ...	14 in. by 12 in.	8	2½	2 4 0	5 6
,, ...	16 in. by 13 in.	8	2½	2 10 0	6 3
,, ...	18 in. by 14 in.	8	2½	2 16 0	7 0
,, ...	19 in. by 13 in.	8	2½	2 16 0	7 0
,, ...	20 in. by 14 in.	9	3½	3 7 6	7 6
,, ...	24 in. by 15 in.	8	2½	3 12 0	9 0
Round.....	15 in. by 15 in.	8	2½	2 10 0	6 3
,, ...	15 in. by 15 in.	10	2½	3 2 6	6 3
,, ...	18 in. by 18 in.	8	2½	3 0 0	7 6
Oval Retort	18 in. by 12 in.	8	2½	3 0 0	7 6

All other sizes and shapes in proportion, to order.

References and further particulars may be obtained on application to the Patentee, Gas Works, BLACKBURN.

NEW PATENT WET GAS-METER.

KNIGHT, MERRY, & EXLEY,

GAS-METER MANUFACTURERS,

14, BARGE YARD CHAMBERS, BUCKLERSBURY,

LONDON,

AND 131, BRADFORD STREET, BIRMINGHAM,

beg to submit to Gas Companies and others some of the advantages possessed by their

PATENT ANTI-CORROSIVE ECCENTRIC GAS METER

over those of the ordinary kind.

The Case is formed of strong Sheet Iron of the best quality by powerful machinery; and, when complete, consists of

FIVE PIECES ONLY,

(the ordinary case contains Twenty-five pieces), which is thickly coated, with a Metallic Alloy, similar to that of the Drum, which renders it as durable as the Drum itself.

The SYPHON, or Spout, is cast in one body, without seam, and is double the thickness of those usually employed.

The parts that communicate Motion to the Index are INDESTRUCTIBLE, and will continue in good working order for an indefinite period.

The FLOAT is cylindrical, and not liable to collapse.

The VALVE is self-adjusting, ensuring soundness and facility of action under all pressures.

The INDEX is thoroughly protected from water rising in the Spindle Tube, should the pressure exceed six inches.

The FILLING and WATER-LEVEL APPARATUS are on the Syphon principle, which prevents the abstraction of Water from the Meter by pressure.

These, with other minor improvements, make this Meter superior in every respect to those generally made.

The Patentees respectfully solicit a trial, feeling confident that its advantages only require to be known to ensure its general adoption. The original principle, so long tried and proved to be correct, has not been departed from in the arrangement of the PATENT METER—the aim of the Patentees having been to perfect what has been already well tested, rather than risk any novel combination or untried invention.

Knight, Merry, and Exley also manufacture the ordinary Wet Gas-Meter, Street Lamps, &c. &c.

Further particulars and Price Lists may be obtained at either of the above addresses.

GAS CONTRACT for Jerez de la FRONTERA.

TENDERS for LIGHTING the City of Jerez de la Frontera, in Spain, with Gas, for the period of 21 years, will be received for FIFTY DAYS, reckoned from the 15th inst.

The number of Lamps which are to be lighted is 835, placed in brackets or iron posts in the public walks, squares, and larger streets; and in the narrow ones and lanes, upon iron brackets or stanchions fixed to the walls of the buildings.

The highest price will be four maravedis per light per hour for the first seven years, three and a half the next seven, and three maravedis per light per hour for seven more.

The Tenders are to be for so many complete quarters less than the last of the three above-named periods, and none will be received excepting on these terms by the Municipality during the said Fifty Days, or at the time of the adjudication of the Contract, which shall take place at twelve o'clock on Saturday, March 7, 1857, in the lower story of the Town Hall of the said City, on the conditions specified in the schedule deposited at the Office of the Secretary of the Municipality of the said City; and the copies of which may be seen in London at Messrs. Zulueta and Co., No. 23, Moorgate Street, City; and in Paris at MM. Ad. Marcuard and Cie., No. 18, Rue Bergère, where they can be examined by such persons as desire to take any part or interest in the matter.

By the President's order,

FRANCO. DE LA QUINTANA Y ATALAYA, Secretary.

The President, RAFAEL RIVERO.

Jerez de la Frontera, Dec. 30, 1856.

CONTRACTS FOR GAS COALS & FREIGHTS.

THE Directors of the European Gas COMPANY will be ready on Wednesday, Feb. 25 next, to receive written TENDERS for the SUPPLY of FIRST-CLASS GAS COALS, to be taken as and when required, during One Year, commencing April 1 next. Each Tender must state the description of coal—a certain quantity, not exceeding 20,000 tons—a price per ton, f. o. b. in the Tyne or Wear—and a fixed rate of discount for cash.

TENDERS will also be received, at the same time, for the CONVEYANCE of such Coals, or any part thereof, from the Tyne or Wear, to ports on the French Coast, at Rates to be named per Keel of Eight Newcastle Chaldrons, taken on board, less discount for cash.

The Directors do not pledge themselves to accept the lowest or any Tender.

The Tenders for Coals and Freights may be separate or combined, and must be addressed, on or before the above date, to the undersigned, at the Office of the Company, No. 3, Moorgate Street, LONDON (E. C.), where further particulars may be obtained on application.

H. M'L. BACKLER, Secretary.

J. W. & J. CHANDLER,

LATE

BEVERIDGE, HEDLEY, & CHANDLER,

ENGINEERS, MILLWRIGHTS,

IRON AND BRASS FOUNDERS, &C.,

MANUFACTURERS OF ALL DESCRIPTIONS OF GAS AND WATER-WORKS' APPARATUS, AND PIPE-TESTING MACHINES,

NELSON FOUNDRY,

PRESTON.

N.B.—A stock of Pipes always on hand, from 1¼ inch and upwards.

PHŒNIX GASLIGHT and COKE COMPANY.

NOTICE is hereby given, that the ADJOURNED HALF-YEARLY GENERAL MEETING of PROPRIETORS, holden previous to the 18th of November last, Five Shares and upwards in the said Company, will be held pursuant to the Act of Incorporation, on WEDNESDAY, the 18th inst., at Twelve for One o'clock, at the Bridge House Hotel, in the Borough of Southwark, for the purpose of declaring a Dividend to Christmas last, to elect Directors and Auditors for the ensuing year, and on other business.

By order of the Court of Directors,
CHARLES PRIDDEN, Secretary.
70, Bankside, Southwark (S.E.), Feb. 1, 1857.

The Dividend to be declared at the above meeting will be clear of Income-tax, and will be payable immediately after the business of the meeting has terminated; and afterwards at the Company's Office, at Bankside, on Thursday, the 19th inst., and also on Monday, the 23rd inst., on both days from the hour of Twelve till Three; and from that time on Wednesdays only, from Two till Four o'clock.

CRYSTAL PALACE DISTRICT GAS COMPANY.

NOTICE is hereby given, that the GENERAL ANNUAL MEETING of the SHAREHOLDERS of this Company will be held at the London Tavern, Bishopsgate Street, in the City of London, on TUESDAY, the 3rd of March, 1857, to receive the Report of the Directors, to declare a Dividend, and for general business. The chair will be taken at three o'clock precisely.

The Books of the Company will be closed for the Transfer of Shares from the 16th day of February until after the 3rd day of March, 1857.

By order of the Board,
MAGNUS OHREN, Secretary and Manager.

TO GAS & WATER COMPANIES, ENGINEERS, AND FITTERS.

GARSIDE'S Registered Tube-Vice holds all sizes of Wrought-Iron and Brass Tubes with the greatest firmness and least possible pressure; consequently it is not so liable to split or damage the Tubes as the ordinary Vice, and considerably facilitates the Workman, who may do almost double the quantity of work. Also,

GARSIDE'S IMPROVED MAIN-DRILLING CLIPS, for Drilling Holes for Service-Pipes. With this Instrument the perforation of pipes for the attachment of smaller Tubes can be effected with great ease and precision. Likewise,

HEAP'S REGISTERED GAS TONGS, most highly approved of as vastly superior to those in present use.

For Drawings, Testimonials, and Prices, apply to Mr. G. JAQUES, 3, Gloucester Road North, REGENT'S PARK, Sole Agent in London; or to the Maker, S. GARSIDE, Stamford Street, ASHTON-UNDER-LYNE.

BY ROYAL LETTERS PATENT.

MESSRS. HOLMES & CO.,
WHITESTONE IRON-WORKS,
HUDDERSFIELD,
CONTRACTORS FOR THE ERECTION OR ALTERATION OF GAS-WORKS,
with Mains, Meters, Service-Pipes, Lamps, Lamp-Posts, Wrought and Cast Iron Tubes, &c.

PLANS, SPECIFICATIONS, & TENDERS,
FOR THE LIGHTING OF
TOWNS, VILLAGES, MANUFACTORIES, &c.

The "PATENT GAS APPARATUS" made by Holmes and Co. is one of the most effective (and ornamental) Apparatus yet submitted to the public.

Hayfield Paper-Mills, near Stockport,
Aug. 4, 1856.

Sir,—Our gas apparatus was erected by Messrs. Holmes, of Huddersfield, about two years ago, and we have had little or no trouble with it since, and is in every respect working beyond our expectations.

If you require gas, you will find Holmes' principle the best. I am, Sir, yours most respectfully,
W. Sutton, Esq., JOHN SLACK.
Scotby, near Carlisle.

Scotby Works, near Carlisle,
Dec, 31, 1856.

Respected Friends,—The gas apparatus you have erected for lighting my works and the village of Scotby produces brilliant gas; and I consider that your contract is fulfilled in an honourable manner, with credit to yourselves, and to my satisfaction. I had intended fixing a gas apparatus some years ago, but, previous to yours, had not seen any I approve of.

I am, yours truly, W. SUTTON.
Messrs. Holmes and Co., Huddersfield.

P.S.—OTHER REFERENCES ON APPLICATION.

OLD IRON FOR SALE.

A Large Quantity of Old Tank Plates and other CASTINGS, made of the very best Iron many years since, can be obtained on application to the SUPERINTENDENT, Chartered Gas-Works, Horseferry Road, WESTMINSTER.

KAY'S Patent Equitable Gas-Meter.
The attention of Gas Companies is requested to the above Meter as an efficient preventive of fraud by "tilting," so often resorted to by dishonest consumers.
Manufactured only by WM. COWAN, 60, Buccleugh Street, EDINBURGH.

GAS TAR AND AMMONIACAL LIQUOR.

THE Board of Gaslight Commissioners for PAISLEY are ready to DISPOSE of the GAS TAR and AMMONIACAL LIQUOR to be produced at their works for Seven Years, viz., from March 1, 1857, till March 1, 1864.

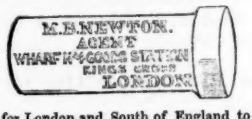
Great facility for removing these products will be afforded by means of a Tye in course of formation, connecting the works with the Glasgow and South-Western Railway.

The Tar and Liquor will be disposed of together or separately: and intending offerers will be informed of the conditions on application to Mr. FOULIS, Manager, at the Works.

Offers for the above, per 100 gallons, addressed to Mr. FARQUHARSON, Chairman of the Committee on Works, will be received till Feb. 20.

Gas Commissioners' Office, Paisley,
Jan. 23, 1857.

J. CLIFF'S
FIRE BRICKS, GAS RETORTS, &c.



Orders for London and South of England to be addressed to Mr. NEWTON, Agent for the District, Park House, Thornhill Road, ISLINGTON (N.).

N.B.—A few Retorts of each size, and a large stock of Bricks and Lumps, always on hand at the above Wharf.

THE CHEAPEST MANUFACTORY
IN THE TRADE FOR
CHANDELIERS and BRACKETS
IN GLASS, ORMOLU, & BRONZE.
OUTSIDE SHOP LANTERN,
Lined with Patent Silvered Glass.
Wrought Iron, Composition, and Tin Tube,
WITH EVERY DESCRIPTION OF
GAS FITTINGS,
ALWAYS IN STOCK.
CHANDELIERS and FITTINGS
made to Order on the Shortest Notice.
JET MOONS, GLOBES, SAUCERS, & CHIMNEYS,
IN EVERY VARIETY, WHOLESALE AND FOR EXPORTATION.
HODGE and ROBERTS,
101, HATTON GARDEN, LONDON.
Pattern Books of Chandeliers, and also of all kinds of Gas Glasses, sent to any part of the Kingdom on application.

THE COUNTY AND GENERAL
GAS CONSUMERS' COMPANY (LIMITED),

Incorporated under 19 & 20 Vict., Cap. 47.

CAPITAL, £50,000 (with Power to Increase),

In 10,000 *Shares of £5 each. Deposit, 5s. per Share on application, and 15s. per Share on allotment.*

Intervals between the Calls, Three Months, with Three Months' notice, and no Call to exceed £1 per Share.

OFFICES—76, KING WILLIAM STREET, LONDON (E.C.).

TRUSTEES.

THOMAS CHAMBERS, Esq., M.P., Great Cumberland Street, Hyde Park.
ERASMUS WILSON, Esq., F.R.S., Henrietta Street, Cavendish Square.

DIRECTORS.

THOMAS CHAMBERS, Esq., M.P., Great Cumberland Street, Hyde Park.
ROBERT M. CHRISTIE, Esq., C.E., King William Street, City.
Lieut.-Col. C. F. LE HARDY, Porchester Terrace, Bayswater.
HENRY W. HAY, Esq., Upper George Street, Portman Square.
ALEXANDER L. IRVINE, Esq., Smyrren Lodge, Peckham.
JAMES MELROSE, Esq., Hatton Garden, London; and Tividale, near Dudley.
WILLIAM MORRISON, Esq., the Terrace, Kennington Park.
GEORGE SILVESTER, Guildford, Surrey.
WILLIAM SIMPSON, Esq., Bradmore House, Hammersmith.

AUDITORS.

F. FERGUSON CAMROUX, Esq., 45, Weymouth Street, Portland Place.
SAMUEL THOMAS, Esq. (Messrs. Thomas and Cates), 9, Sise Lane, Bucklersbury (Public Accountant).

SOLICITOR.

Mr. Under-Sheriff CROSLEY, 34, Lombard Street.

BANKERS.

WESTERN BANK OF LONDON, 21, Hanover Square.
BANK OF LONDON, Threadneedle Street.

ENGINEER.

H. P. STEPHENSON, Esq., A.I.C.E., 58, Pall Mall.

BROKERS.

Messrs. CROSLEY, BROTHERS, 30, Cornhill.

SECRETARY.

R. S. PARKER, Esq.

This Company is established for the purpose of extending the benefits of Gas Lighting to towns and villages with populations varying from 2000 to 5000 and upwards, not at present possessing its advantages; also to such other localities as the extension of railway communication may have created or more fully developed.

The great progress and improvement of all Gas establishments is clearly demonstrated by the immense increase of its manufacture, the large reduction in price, and the high market value of the shares of most Gas Companies (as shown in the full prospectus).

The cost of preliminary expenses and management has hitherto, in many instances, prevented the introduction of Gas into small towns; though, notwithstanding these drawbacks, numerous instances exist where towns of small population, involving comparatively but little outlay, pay large dividends; it is therefore anticipated that under the single expense of formation, and the united management proposed by this Company, its dividends will bear a still higher proportion.

The Engineer of the Company has already examined several towns, some of which have applied to be lighted; these will in all probability form the first operations of the Company.

Applications for Shares, Prospectuses, and other information, may be obtained of the SECRETARY, at the Offices of the Company, 76, King William Street, CITY; or of the Brokers, Messrs. CROSLEY, BROTHERS, 30, CORNHILL.

CONTENTS.

	PAGE
Leading Articles:—	
Notes on Passing Events	69
Circular to Gas Companies	70
Communicated Articles:—	
On the Substitution of Coal for Coke in Locomotives	72
Coke	74
Register of New Patents:—	
Gurney's Improvements in Warming and Moistening Air	75
Provisional Protections	75
Notices of Intention to Proceed	75
Miscellaneous News:—	
Report and Balance-Sheet of the Phœnix Gas Company	77
Meeting of the Chester United Gas Company	75
Public Lighting in Southwark	77
Stealing Gas in Bristol	78
The Liverpool Meter-Testing Apparatus	78
Rating of Water-Mains	78
Price Current	78

TO CORRESPONDENTS.

A Gas Engineer.—*The blueness of the flame given by the combustion of a mixture of gas and atmospheric air through a wire gauze, arises from the presence of nitrogen, an incombustible gas, of which the air contains about 80 per cent.*

J. K. H.—*Section 24 of the "Nuisances' Removal Act for England, 1855," imposes a penalty of £200 upon "any person or company engaged in the manufacture of gas, who shall at any time cause or suffer to be brought, or to flow into any stream, reservoir, or aqueduct, pond, or place for water, or into any drain communicating therewith, any washing, or other substance produced in making or supplying gas," and we apprehend the law officers of the Crown will contend that an arm of the sea is protected from pollution by this clause.*

NOTICES.

Subscribers who have not yet paid their subscriptions (1856) are requested to remit 18s. for the entire year, or 9s. for the half year, by Post-Office order, payable to Thomas G. Barlow, at the Charing-Cross Money-Order Office.

The subscription is 15s. per annum, if paid in advance, or 18s. on credit, payable in two sums of 9s. each, due in July and January of each year.

The next number will be published on Tuesday, March 3, and the subsequent numbers on each successive alternate Tuesday, till our project of weekly publication is carried into effect.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

All Communications to be addressed to the Editor, No. 3, Parliament Street, Westminster; and orders for Advertisements to Mr. W. B. King, the Publisher, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, FEBRUARY 17, 1857.

NOTES UPON PASSING EVENTS.

OUR Legislature has recently, under the guidance of Mr. Schofield, displayed a degree of virtuous horror of the frauds of small tradesmen, and a laudable desire to create places for a body of dependants to be charged with the protection of the stomachs and the pockets of a nation which had hitherto gloried in its proficiency in the arts of self-defence; but, alas for our national reputation! whilst the House of Commons applauds the crusade against the petty sins, the trickeries and deceits of shopmen, it patiently tolerates the—what shall we call them?—playful violations of truth, the "artful dodges" of our leading statesmen. Far be it from us to attempt to defend the tricks of trade. They are highly reprehensible in a moral, and often dangerous in a sanitary, point of view; but we believe that the best and most effectual remedy for a tendency of this description is to be found in an improvement of the general tone of social morals, because legislative and penal restraints of fraud can at any time be easily avoided; whereas the restraining action of an higher standard of right and wrong would act continually, and, in cases far beyond the letter of the law to prevent even the attempt to deceive. Such improvement in the tone of society must begin in the highest ranks, and certainly the public is entitled to expect that they who make laws to punish the practical lies of trade should themselves be remarkable for their own veracity. The painful exhibition of the principles which still prevail amongst our statesmen, elicited by Lord Palmerston's replies to Mr. Disraeli's recent accusations, together with the previous exposures of the reckless frauds perpetrated by his lordship's colleague, Mr. Sadleir, and by some other members of Parliament, have so effectually destroyed the moral influence of the Legislature, that any measures it may pass for the prevention of adulteration of food must, we fear, be powerless for good. It should begin its work of reformation within its own doors; and, when it has taught statesmen that "words were *not* given to disguise meanings," and that the "cooking" of public documents, packing committees, and suppressing truth, are only worthy of small hucksters, then it may, with a show of propriety, proceed to punish the humble imitators of the traditions of "the upper ten thousand" as they have lately been displayed to the world. Formerly, the *Times* would have launched the thunders of its eloquence against the minister who could have set such an example as was set by Lord Palmerston in the course of last week; but since its editors have become placemen, its virtue is less susceptible than it was wont to be—nay, it even glosses over the skilful word-fencing of its master. Yet we ask seriously, Are not they who taint a nation's morals far more guilty than they who adulterate its food? and do not the statesmen who display a systematic disregard for truth so taint them in the most insidious and fatal manner?

We call particular attention to the episode in the history of the present parliamentary campaign between Lord Palmerston and Mr. Disraeli, although it is connected with a class of subjects foreign to our usual pursuits, because it indicates forcibly the danger to which all industrial operations are exposed in our country. It is absolutely impossible to attach to the words of the Government the meanings those words ordinarily convey, after the exhibition which has taken place; and, indeed, the conduct of the Chancellor of the Exchequer, in proposing the Bank Charter inquiry, that of Mr. Lowe in the matter of the Passing Tolls' Bill, and that of Mr. Gibson with respect to the Mersey Conservancy Bill, show that every manœuvre is considered fair by those in power to secure the ends they propose to themselves. Emphatically, then, do we warn the monied interest that they must bestir themselves, if they desire to secure more fixed principles in the controul of the money market than now prevail; as we also warn the parties who only possess "musty parchment" rights connected with the passing tolls, especially the Corporation of Liverpool, that their interests will be as unhesitatingly sacrificed to the crotchets of Mr. Lowe, as the vendor of adulterated food sacrifices his clients. The Government has lately, perhaps not intentionally, placed itself in a state of antagonism to private industry, and has adopted the traditions of continental administration. It is time for private industry, therefore, to organise in its own defence, and to resist the tendency of our rulers to substitute for its free energy the lifeless action of an army of commissions, boards, or other branches of the Government: and so long as the said Government is composed of men who are adepts in "ministerial jesuitism," and who act as if they literally believed in Talleyrand's maxim, that "words were only given to disguise our thoughts," no rights can be considered sacred, no property safe. The very same number of the *Times* which contained the disingenuous fencing of the Chancellor of the Exchequer with the Bank Charter question, recorded M. Guizot's lament for the destruction of the parliamentary system in his own country. There is much food for reflection in these accidental conjunctions! We ourselves, who knew France intimately during M. Guizot's reign, know also that he fell, and the parliamentary system with him, principally because the moral consideration of the government had been destroyed by the unblushing prevarications of the ministers, and the awful corruption of far too many of their subordinate officials. Like causes must produce like effects here; and it is the duty of every Englishman who respects his country to resist the torrent of demoralisation which seems to be gaining upon us on every side, or we, too, may be "continentalised," to quote a favourite phrase of one of the "ministerial Jesuits."

Under any circumstance it is the special duty of every journalist who is connected with industrial operations to record his protest against the Australian doctrine of Mr. Lowe, that a Parliamentary title to any property is superior to a "musty parchment." What Parliament can make, it can always unmake; and certain it is, that when the prescriptive rights, represented by old musty parchments, are ignored, those guaranteed by Parliament cannot be safe. Mr. Lowe raised in this instance a very grave question, viz., that of the omnipotence of

Parliament, which cannot be disposed of in his flippant "leader" style; but really there would appear to be reason to believe, from the operation of some recent laws, that we require in England a tribunal, like the Supreme Court of the United States, which should sit in judgment upon the Acts both of the Government and of the Legislature, with power to reverse their decrees when these are opposed to the Constitution. Fortunately, the present Speaker of the House of Commons is both able and willing to keep such statesmen as Mr. Lowe, under ordinary circumstances, within the bounds of the law; but he will not always be in the chair, and who can answer for the person who may succeed him?

To descend from these regions of transcendental politics to the ordinary affairs of life, we would observe that the Metropolitan Board of Works appears to be labouring hard to recover the ground it has lost in public estimation, by making a violent effort in favour of public parks. If it could succeed in effecting some real good in this matter, Sir B. Hall's abortive attempt at legislation would not be without a redeeming point; but unfortunately the whole scheme of the Metropolis Management Bill has been so effectually spoilt by its own inherent defects, and by the want of dignity of the present board, that we very much question whether the latter can now really insure a sufficient amount of support from the public at large to carry out even the scheme for the improvement of the metropolis in respect to its places of amusement. On the south-east of London, for instance, there is already much difference of opinion as to the position of the proposed park; on the north there will be a dispute as to whether Finsbury or Hampstead should have the precedence; and who would consent to submit these questions to a board which has proved itself so incapable of forming an opinion upon the subject of the sewerage, for which it was specially appointed? It is odd, however, that the same public which was so clamorous for the decision of the Metropolitan Board upon the sewerage scheme, seems to have forgotten all about that wondrous work, now that Sir B. Hall has determined "not to do it," and has handed the whole question over to a red-tape commission.

Be this as it may, we would venture to call the attention of the various Local Boards of Works, and of the Government Commissioners, to the disgraceful state of the Metropolitan roads, both paved and macadamised. In no city in Europe, but our Metropolis, would the roadways be allowed to be repaired in the same painfully extravagant manner which is tolerated by our authorities; and it is inconceivable that in a practical country—in a land which professes, of all others, to excel in the beauty of its roadways—we should still be compelled to witness the consolidation of the metal laid upon a macadamised road by means of the traffic alone. Most distinctly do we affirm that such a system is both costly, insomuch as it wastes the raw material; and cruel, insomuch as it throws a great and unnecessary amount of labour and suffering on all the draught cattle of the Metropolis using the roads so mismanaged. Our rulers are fond of "continentalising"—why do they not take a lesson from our French, or our Prussian neighbours in this matter? and why do not the authorities connected with the paving of the East Strand especially, keep it in better order? We were told by the *Times*, and the other ministerial hacks, when Sir B. Hall's bill passed, that all these minor evils were at once to be remedied, but for our parts we can see no improvement in the municipal affairs of the Metropolis, unless it be in such parishes as Bermondsey, and some of the others on the south of the Thames. On the north of the river parochial business seems only to have become "worse confused" than it was previously to the introduction of this new element of strife, and certainly some of the principal roadways are in a very disgraceful state. Oxford Street itself, for instance, is cleaned, but the New Road and the back lanes of Marylebone are sadly neglected; and Dr. Thompson would more effectually advance the sanitary improvement of his district by compelling the parish authorities to maintain in better order than they actually do the paving of the poorer portions of their district, than by wasting his time in questionable crusades against pumps. The latest returns of the Registrar General, indeed, show that the very favourable rate of mortality, which prevailed in London last year, was far from being normal or permanent. The sphere of the action of parochial authorities upon the causes of mortality is sufficiently wide to justify us in urging them to address themselves manfully to their task.

The virtuous Corporation of London, we observe, is talking of reforming itself. "It is never too late to mend;" and, as public opinion has been expressed rather distinctly upon the necessity for some sweeping measure of this description, it is to be hoped that we shall not again be insulted by another of the illusory projects which our municipal authorities have hitherto offered. We confess, however, that we anticipate little good from the parties now in power at Guildhall; for their connivance with Mr. C. Pearson's long-continued system of making things comfortable, in the matter of the royalty obtained from the Great Central Gas Company's contractor, indicates a laxity of morals amongst them worthy even of a Prime Minister, or an Australian politician. The *Times* cannot notice this shameful job, because Mr. Delane is one of the directors of the Great Central; but what motive can exist to prevent such men as Messrs. Copeland, Cubitt, Lott, Harrison, Loman Taylor, Elliott, &c., from probing to the bottom the disgraceful proceedings connected with this re-establishment of the system of "black mail" for the benefit of the legal adviser of the Corporation? Mr. Bennoch himself is bound, we think, to prevent the late disclosures of Mr. Pearson's conduct from being forgotten.

At Liverpool, the "Pike" controversy continues to rage, and as it has assumed a very personal tone, the public may fairly suppose that the real merits of the question have been, for a time, lost sight of. The opponents of the scheme for years contended that the works could not have been executed; now that the water from Rivington Pike is in the town, they declare that it is of a dangerous quality, and revive the old dispute of the action of water upon lead, which has furnished food for philosophical sophistry for the last eighteen hundred years. Still, we should have thought that, in the north-west of England, the system of gathering grounds had been applied to a sufficient extent; and that the qualities of the waters distributed in such towns as Manchester, Bolton, &c., must be sufficiently like those of the Rivington district to enable the public to form its own opinions on the subject, irrespective of the "scientific evidence" it has been our misfortune to peruse.

We call the attention of our readers to a set of tables, recently published by Mr. C. Vion, of Adam Street, Adelphi, showing the relations between the English and French weights and measures. For commercial purposes, it will be found to be sufficiently correct and of great use; but perhaps it would have been as well, in a document of this description, to have called attention to the fact, that the length of the French mètre is not exactly equal to the 10,000,000th part of the quarter of the earth's circumference at the equator, as is stated by inference in the portion of the tables containing the "nautical measures;" for the circumference of the earth, there is 40,002,952 mètres, not 40,000,000, as stated. M. Vion has also made a mistake in translating "Troy weight" by "*poids étalons*." The word *étalon* means "*standard*," and there is an *étalon* for the pound avoirdupois just as much as there is for the pound troy, and for the yard, or mètre. Perhaps, also, it would have been better had M. Vion paid more attention to the correctness of the decimal figures of his equivalents; as, for instance, in the case of the square yard, it would have been better to have rendered it by the French equivalent of 0·83697 mètre, instead of 0·8360. This small error, often repeated, might produce serious effect. On the whole, however, the tables will be found to be, as we said before, very useful.

In our advertising columns will be found the announcement of a company which will, we hope, effect much good for the country districts; we mean that announcing the formation of the Country and General Gas Consumers' Company. At the present day, no village, no large mansion even, should be without its gas-works; and the agriculturalists would find themselves greatly benefited by this new source of supply of artificial manures. Most heartily, then, do we wish good speed to the enterprising men who have thus undertaken to enlighten "the agricultural mind." Such investments are both safer and better than interoceanic canals across the Isthmus of Darien, or Euphrates Valley schemes, undertaken, as these last seem to be, without proper surveys, and upon the faith of reports in direct contradiction to natural philosophy or to common sense.

Circular to Gas Companies.

The *Times* has just discovered that Lord Palmerston's government is troubled with a "ghost," in the person of Lord Chancellor Cranworth, whose peculiar province, we are told, it is to save the *shell* and throw away the *oyster* of every legal im-

provement submitted to the Legislature; the husk, and not the kernel, being, it seems, the object of his lordship's forensic solicitude. Now it does so happen, that we seldom find ourselves in a position to agree with the conclusions of our alternately truckling and truculent comtemporary, and, therefore, it affords us all the more pleasure, in this instance, to proclaim our unanimity in respect to the existence of the said "ghost:" we have seen him, and can testify that his peculiarities have been most faithfully delineated by the authorities in Printing House Square. We do not, however, believe that these peculiarities owe their origin to any legal defect in Lord Cranworth's understanding; but, on the contrary, arise out of a kind of mental oscillation or pendulum-like movement, which, seeking the centre of gravity and truth, sometimes, after the fashion of Macbeth's vaulting ambition, "overleaps itself, and falls on the other side." An instance of this description may be found in the opinion entertained by Lord Cranworth in the case of Broadbent *versus* the Imperial Gas Company, upon the 19th of December, 1856, and the judgment pronounced on the 31st of January, 1857, which perhaps illustrates our position as well as any; and, therefore, we will briefly direct attention to it. On December the 19th, his lordship was quite clear that "the injunction in this case was not very satisfactorily framed, because it left the question just as it was before the case was heard." On Jan. 31, however, he considers Mr. Vice-Chancellor Wood "was perfectly right in awarding a perpetual injunction to restrain," &c. Again, on Dec. 19, when alluding to the arbitration, his lordship remarks, "instead of being heard before a jury, it was heard before Mr. Serjeant Channel, from whose decision there was, of course, *no appeal*. That being so, am I to take the finding of Mr. Serjeant Channel as being such a finding as ought to satisfy the conscience of the court as to what the truth is? With the greatest possible deference to that very learned gentleman, I doubt whether that is a finding which, according to the rules of this court, ought to satisfy my conscience, as the finding of a jury would satisfy it. I can see many differences." Yet, on the 31st of January, the same individual is of opinion that the finding of the arbitrator is conclusive, and that he is "bound to take, and he does take satisfactorily to his own mind, the finding of the arbitrator as decisive on the subject!" The many differences, including even the right of appeal, betwixt the finding of an arbitrator and the award of a jury, had all vanished from the mind and conscience of the Chancellor in about six weeks. Yet, curiously enough, the "two or three patent facts," upon which the Chancellor tells us he decides the case, are precisely facts which would have fallen to the ground as absurdities before the searching investigations of a jury; take for example the assertion of one of the witnesses, that he "had by the aid of a microscope detected crystals of sulphate of ammonia betwixt the bark and wood of the plaintiff's trees," but which, be it remembered, had been seen by no other person, even on that side of the question; well, having seen something with his microscope, how did this microscopical examiner know that it was sulphate of ammonia which he saw? what test had he capable of detecting a quantity of sulphate of ammonia so small as to be visible only under a microscope? and in what way would he have convinced a juryman, endowed with common sense, that his assertion was worth a rotten nut? The truth is, there is no possible means of determining the fact so recklessly sworn to on this occasion, and had a cross-examination before a jury taken place, the promulgator of that statement would probably have looked a little worse than ridiculous.

Then again we have another of the Lord Chancellor's "patent facts" in the assertion that "120 tons of coals are consumed every day" upon the Fulham Gas-works. They are consumed! mark that!! *ergo*, the smoke is in proportion, and is "poured out in dense volumes that come down upon the vegetables and fruit-trees and flowers in this garden." Yet it had been explained over and over again that the coals were *not* consumed, in any other sense than a baker consumes a sack of flour when he makes it up into quartern loaves; because the gas company does not consume the coals, but merely manufactures them up into coke and gas, which are *consumed* by the public at large; whilst as regards the "smoke," we very much doubt whether even the consumption of 120 tons of coals could create one-half the dismal obscurity displayed in the Court of Chancery upon this simple question. To distil coals in a closed vessel, by which all the products are collected, and to consume them in a furnace, where everything is dissipated in the air, comes to one and the same thing in the opinion of the Lord Chancellor! who, moreover, "wants no chemists or other scientific people to tell him that that must be injurious!!" He believes that "crystals," consisting of sulphuric acid and *ammoniacal acid* (!), exist in the bark of the plaintiff's trees, and yet he "wants no chemists or scientific people" to teach him the absurdity of his own language!

On the 19th of December he is able, with all deference to the very learned Serjeant Channel, to "see many differences" betwixt that gentleman's finding and the decision of a jury; nay, even so late as the middle of the day of the 31st of January, he is aware that "the ordinary rule is, *never* to issue an injunction for a nuisance until the existence of the nuisance has been established by a trial at law." And what is a trial at law? It is that palladium, that safeguard, the only safeguard of British liberty; trial by a jury of peers. And is the decision of Mr. Serjeant Channel an equivalent to such a trial? Is Serjeant Channel the equivalent to "twelve good men and true?" Is he a jury? On December 19th, the Chancellor of England tells you he is not, and that there are "many differences," but on January 31st the pendulum has gone to the other side, and lo! the Lord Chancellor, "upon full consideration, thinks Serjeant Channel *is* a jury." Here, then, is an end of the jury system; why ask twelve men to do that which one alone can effect? Brother Channel is a jury: he who had no great luck in procuring briefs at the bar, has now an endless retainer in the jury box: but he is more than a jury, he is also a judge; nay, he is more than both judge and jury, for there is no appeal from his decision. "We are a king," exclaimed Lear, and Mr. Serjeant Channel may fairly call himself "an autocrat."

Yet we have all along foreseen that the arbitrator system must end exactly at this spot, and that, in fact, it was a direct attack upon our constitutional practice of trial by jury. Let us conceive that same "Brother Briefless" is a very jolly fellow, who is much respected by his *confrères*, but most unfortunate in his engagements; he must live, nevertheless, and what so likely to aid him in that way as a few friendly cases of arbitration? But then comes a difficulty—of what value or force is the decision of our brother as an arbitrator? If it is not equal to that of a jury, then "Othello's occupation's gone," and the brother's office looks very like a legal "job:" if it is equal in force and significance, how came Lord Chancellor Cranworth to see "many differences?" The question becomes puzzling, and we would much rather see it answered by the elevation of Brother Channel to the bench than to the jury-box. We are not ignorant of the fact that a strong desire exists in certain quarters to abolish trial by jury altogether, in consequence, we presume, of the growth of intelligence amongst that class from whom jurymen are now selected, and which renders them at times troublesome to "my Lud," who, of course, would much rather see them act upon his "*ipse dixit*," than have the impertinence to think for themselves. Hence the arbitrator plan of superseding the function of a jury is particularly convenient in every sense: there is the appearance of the thing without the reality; the expense of both without the advantage of either: and lest common sense should raise a doubt whether the opinion of one man was equal to the conjoint opinion of twelve, we have the Governmental "ghost" to tell us that the conclusion of a single arbitrator, from which there is no appeal, is as decisive of the truth and justice of a case as the verdict of a jury, from which an appeal lies to the superior courts of laws, where any mistake made in reference to the testimony of the witnesses, the summing-up of the judge, or erroneous conception of the jury, might all be set right, and a new trial obtained.

There is, nevertheless, a question which, if ever our governmental place-jobbers can find time to investigate it, may not only put an end to the Briefless Arbitrator system, but also confer an enduring boon upon the manufacturing interests of the country. That question is the introduction, in special cases, of what is known in France as a jury of "*Experts*"—that is to say, of persons experienced in the peculiar subject of the trial, and, therefore, particularly qualified to deal with the evidence brought forward on both sides. This country is sick and weary of the conventional gabble of what it calls "the Bar," and which it knows to be, for the most part, a mere "bar" to justice and common sense; if matters involving, as is not unusual, many thousands of pounds are to be determined correctly, let us, at least, have them determined by persons who

know what they are about, a practice which we see answers exceedingly well on the other side of the straits of Dover. Compare, for instance, the case now before us as dealt with by the brother arbitrator Channel, the Vice-Chancellor Wood, and the Lord Chancellor Cranworth; contrast this, we say, with the examination and decision of a "*Jury d'Experts*" in Paris, sitting upon the same subject. Where then would have been the "*free sulphuric acid on the leaves*," the subsequent "*free ammonia*" on the same leaves, forming, not till then, "*sulphate of ammonia, which could be seen by a microscope in crystals betwixt the wood and the bark?*" Did we say where? Why, no where to be sure; because the said jury would have laughed it all to scorn. And so with respect to the pretended combustion of 120 tons of coals per day, the jury would have said at once, "this statement is a grossly-exaggerated romance, because we know quite well that gas manufacturers do not purchase coals to consume, but to convert into gas and coke for sale, which gas and coke, when burnt by the public, must evolve much less impurity than the original coal, inasmuch as that the greater portion of the impurity of the coal remains in a harmless state at the gas-works." Yet Lord Chancellor Cranworth has assumed that these 120 tons of coals are daily consumed by the Imperial Gas-Works at Fulham; that they give off "volumes" of black smoke, containing ammoniacal acid!" and other absurdities; and that he "wants no chemist" to teach him "these are injurious:" though the plaintiff has not dared to produce his business books in open court to prove, if he can, that he is not doing quite as well with his garden as any other person in his neighbourhood.

But enough has been said to show the necessity of changing the present very unsatisfactory system, and substituting for it one reconciliable to the dictates of reason. Your arbitrator, Vice-Chancellor, and Chancellor, might just as well undertake to adjudicate upon a scroll of hieroglyphic or arrow-headed characters from Nineveh, as upon questions involving the higher branches of science. The thing is indeed a solemn farce, and vastly too old for the wants of the present day. What say my Lords Brougham and Redesdale?

At a recent meeting of the Commissioners of Sewers for the City of London, Dr. Letheby presented his yearly report on the illuminative power and chemical quality of the gas supplied to the city by the Great Central Gas Consumers' Company, from which it appeared that its luminosity during the first quarter was equal to that of 13·25 sperm candles; during the second quarter to 12·75 candles; during the third quarter to 12·5 candles; and during the fourth to 12·9 candles. The yearly average being 12·85 candles. The gas was examined at the London Hospital and at Coleman Street; and 242 experiments were made. Will Mr. Dakin now say that the tables of illuminating power, published in this JOURNAL in 1852 and 1853, were "fabricated and faithless?" or, will he make the *amende honorable* by admitting their perfect accuracy? Dr. Letheby further goes on to state, that "the chemical quality of the gas was also remarkably good during the first nine months of the years, but during the last three it has contained a notable proportion of sulphuretted hydrogen and an excess of ammonia." The coincidence in point of time between the detection of impurities in the gas and the commencement of the existing difficulties between the company and Mr. Croll, is very remarkable, and naturally suggests an inquiry as to what influence may have set in motion that "crawl on their belly," sycophancy (so graphically described by Mr. Roebuck as pervading the House of Commons in regard to the place-hunters and office-disposers), which the recent discovery of Dr. Letheby indicates. We have over and over again pointed out that minute traces of sulphur compounds are invariably present in the best purified coal gas, as well as in some of the vegetable oils used for the purposes of illumination, and the presence of ammonia sufficient to neutralise the sulphurous acid produced on their combustion is a benefit rather than an injury to the gas.

Communicated Articles.

ON THE SUBSTITUTION OF COAL FOR COKE IN LOCOMOTIVES.

By MM. COMMINES DE MARSILLY AND CHOBRZINSKI.

[Compiled from an article in "Les Annales des Mines," No. 1, of the year 1856.]

THE substitution of coal for coke in the grates of locomotives has long engaged the attention of engineers. In England, a great number of systems have been tried—amongst others, in the cases of the locomotives of Mr. M'Connel and Mr. Crampton (with grates 4 feet 10 inches long, by 3 feet 5 inches wide). But, when caking coals were used, it was found that they clogged the bars, gave off much smoke, and required a very strong draught, whilst the production of steam was much less than when coke was burnt, and the consumption (in weight) of fuel greater; when, on the contrary, the anthracite (or thin) coals were used, the smoke was avoided; but the coals exploded on the grates; a portion fell through upon the roadway; another part passed into the smoke-box, and burnt there, to the detriment of the draught, and often rendered it necessary to stop the engine. For these reasons, the use of coal has been generally abandoned in England; and, though on the South-Western Railway some complicated arrangements of the fire-box have been introduced for the purpose of diminishing the smoke, they do not appear to have succeeded.

In Germany, no attempt worth notice has been made to substitute coal for coke. In Belgium, coke is generally used; but occasionally, upon the state railways, patent fuel is mixed with it; and upon the small railway of Flénu, as also on the line from Gand to Antwerp, coal only is burnt. The coal in these cases is a free-burning coal, giving little or no smoke; and it is used after being screened.

In France, several essays were made for the purpose of substituting coal for coke, and on some occasions with considerable success; but, up to the beginning of 1855, these essays were far from being entirely satisfactory: the consumption of coal was greater than that of coke; much inconvenience was felt to arise from the smoke, and from the minute portions of incandescent fuel which passed through the chimney, or the larger portions which fell through the fire-bars; and, in fact, coal was never used unless coke were at too high a price, or could not be obtained under any circumstances.

About this period one of the authors of this notice proposed the use of stepped grates instead of the ordinary form, and some trials were made under the directions of M. Petiet, *chef de l'exploitation* (manager of traffic), on the Northern Railway of France. At the present day more than 100 locomotives on the Northern and on the Orleans Railways are worked with coal instead of coke, upon these stepped grates. The production of steam is rapid, the speed of the trains easily maintained, and the smoke is completely burnt (*sic in orig.*), or it is sufficiently kept under control as not to annoy passengers. Nor is this all: the consumption in weight of fuel per train and per kilomètre (1093·63 yards) has been diminished when coal has been used instead of coke; so that the economy to the railways arises—1. From the diminution in the price of the combustible; and, 2. From the diminished consumption.

The stepped grates are composed of two parts. The first, which is by far the most important, is formed of flat wide bars, placed one above another like the steps of a staircase, but with this difference, that the interval between each bar (or the riser) is open, so as to allow the passage of air. The second part is horizontal, and consists of some ordinary fire-bars; and the combustible covers the whole grate.

Each flat bar or step overlaps the bar beneath it, so that the fuel placed upon the latter cannot fall off, if the overlap be sufficient. The importance of this arrangement will be at once apparent to any one who reflects upon the tendency of the ordinary movement of a locomotive to produce an action similar to that of a dressing-bed, and to sift the fuel which may be placed on the grate. Another advantage presented by this arrangement consists in the means it offers of increasing the quantity of air which is admitted to the fuel in combustion (and we would add, that it is precisely to this increased admission of air that the diminution of the smoke in these locomotives must be attributed. Oddly enough, the very able French authors of the notice we have endeavoured to condense, talk of *burning* or consuming smoke just as one of my Lord Palmerston's toadies would do). A striking characteristic of these grates is, indeed, that they give off very little smoke. When free-burning coals, such as those of Charleroi or of the centre of France, are used, and the current of air is active, no smoke is evolved; with more caking coals, a certain portion of smoke is given off, but if those coals be not extraordinarily smoky, like some of the English and Belgian coals, no sensible inconvenience will be produced. This may be accounted for by the disposition of the bars. The coal, indeed, is charged upon the two or three first bars, and, before throwing it in, the stoker pushes upon the lower bars the coal which was formerly upon the upper ones. The combustion is most energetic at the lower part of the grate; but, when the coal arrives there, it has already passed through a commencement of calcination, and the greater part of the smoke has been given off; the air which is admitted then suffices to burn the small quantity still formed. On the other hand, the coal thus added remains in front; it is in a thick bed, and only in contact with a small quantity of incandescent coal; it distils slowly, and the smoke which it produces is never sufficiently abundant not to be completely burnt by the air in excess, which has traversed the layers of incandescent coal accumulated at the bottom of the grate. If the nature of the coal be such as to give off much smoke, even when burnt slowly, the smoke will not be entirely consumed; it will be the same with free-burning coals, if the stoker, instead of

charging in front, should throw the coal to the bottom or back of the grate, when evidently a dense smoke would be formed.*

It is important for the management of the fire of a locomotive that the bars should be easily cleaned, and that the engine-driver should be able to draw it altogether, if necessary. For this last purpose, the horizontal bars were made to turn on an axis worked by a lever. As some inconvenience arises from the smoke given off whilst the locomotives are stationary, particularly when caking coals are used, a small pipe is introduced from the boiler to the escape-chimney, on which is placed a stop-cock. As soon as the driver shuts his regulator, he turns this cock and opens the fire door; the steam, which escapes through the chimney, creates a strong artificial draught through the door, and thus introduces the necessary quantity of air.

The result of these arrangements has been to allow the combustion of coal to be effected with as little inconvenience as that of coke in ordinary grates; and these results depend upon two principal elements:—1. The nature of the coal. 2. The system of the machine, and particularly the dimensions of the grates.

With respect to the nature of the coals, the French engineers classify those obtained from the neighbourhood of Mons into four divisions:—1. The thin coals (*les houilles maigres*), like our anthracites; 2. The rich coals (*les houilles grasses*), our caking coals; 3. The hard coals (*les houilles dures*), our free-burning coals; and, 4. The flaming coals (*les houilles flambantes*), our flare coals. These varieties are characterised by the volatile matters they contain, which may be stated as follows, after deducting the ashes:—

1. The thin coals contain from 9 to 15 per cent. of volatile matters;
2. The rich coals contain from 20 to 26 per cent.;
3. The hard coals contain from 26 to 34 per cent.; and,
4. The flaming coals contain from 33 to 40 per cent.

The proportion of cinders varies from 1 to 5 per cent. in the samples, free from schist or pyrites. The coals from the basin of the centre of France, and those from the neighbourhood of Charleroi, differ in some respects from those of Mons; but it may suffice here to state that the English coals sent to France consist principally of the Hartley (a free-burning coal), containing from 35 to 38 per cent. of volatile matters; of the rich caking coal, fitted for gas-making, smiths' forges, or coke, containing from 23 to 32 per cent. of volatile matters; and of the Welsh thin, or anthracite, coals, which do not cake easily, if at all.

The thin coals decrepitate upon the fire, and fall into small pieces; the current of air, which is very strong, on account of the form of the grate, carries off many of these particles with the smoke, and these pass off through the chimney, or remain to choke the tubes. This description of coal could only be used by increasing the size of the fire-box, and diminishing the velocity of the draught.

The free-burning coals, containing from 12 to 19 per 100 of volatile matters, answer very well, as in the cases of the Cardiff coals, and those of Anzin, in the Department du Nord. The caking coals are not easily worked, either in locomotives or in steam-boilers generally, on account of their fouling the grates; but the rich coals of Charleroi and of the Centre, which contain from 19 to 23 per 100 of volatile matters, answer the best. The Hartley's coals, and even in a more decided manner the Newcastle caking coals, do not answer in the locomotives of the Northern Railway of France. The patent fuel, in bricks, burns remarkably well, if dried at a proper degree of heat (that is to say, to a point corresponding with a dull red heat); and from the regularity of their form it is found that the use of these bricks is extremely advantageous, on account of the economy of space. It may, however, be observed, that the authors of this notice state that almost any description of coal could be used, provided the grates were altered to suit them; as now constructed, the free-burning coals above described appear to be the best suited for combustion in the fire-boxes of railways. They are generally used in the condition known amongst workmen by the term "knobbly" coals, with about 10 per cent. of small coal.

Great precautions appear to have been taken by MM. De Marsilly and Chobrzinski to ensure a fair comparison between the results of the comparative working of the locomotives when coal and coke were used; and the observations were not only made upon machines of the same construction, running over the same portions of the road, and performing the same service, but they were carried on for a lengthened period, in order to eliminate any accidental sources of error. With the baggage engines, the consumption per train and per kilomètre was obtained simply by dividing the total consumption by the distance run. With passenger engines, however, a deduction was made for the quantity allowed for lighting, for reserve, and for overload, in order to reduce the consumption to its normal limits. The following are some of the tables inserted in the notice:—

* All this reasoning is, as must be at once perceived, only partially true, because it is based on the assumption that smoke can be burnt: the real advantage of the stepped grates lies, however, in the fact that sufficient means of access are given to the air necessary for the combustion of the gases, which must be effected in order to prevent the formation of smoke; this, as Mr. C. W. Williams has shown, cannot be burnt.—Note by Translator.

HEAVY BAGGAGE ENGINES.

Coal in 1855.

Engines from Stations.		Kilomètres.	Kilogrammes.	Kilogrammes per Kilomètre.
Paris ..	April 1 to Nov. 1 ..	249,154 ..	3,203,710 ..	12·8
Amiens ..	May 1 to Nov. 1 ..	84,648 ..	1,113,950 ..	13·1
Lille ..	May 1 to Nov. 1 ..	114,618 ..	1,526,860 ..	13·3

Coke in 1855.

Engines from Stations.		Kilomètres.	Kilogrammes.	Kilogrammes per Kilomètre.
Paris ..	April 1 to July 1 ..	69,410 ..	1,136,672 ..	16·3
Amiens ..	May 1 to June 1 ..	22,779 ..	370,550 ..	22·9
Lille ..	May 1 to Aug. 1 ..	27,166 ..	442,400 ..	16·2

It was interesting to compare the consumption of a mixture of coal and of coke in ordinary grates; and observations were made upon four large baggage engines, which ran between the stations of Paris and Amiens, and performed between May 1 and Aug. 1 38,295 kilomètres, burning—

	Kilogrammes.
Coke	124,655
Coal	445,100
Total	570,555

or, per train and per kilomètre, 14·8 k. In this case the engines worked better with a mixture of 1/5th of coke than when coal alone was burnt.

It was then observed that in baggage engines with small grates the consumption was—

Coal in 1855.

Stations.	Kilomètres.	Kilogrammes.	Per Train per Kilom.
Paris	53,759	443,100	8·2
Lille	16,129	170,401	10·6

Coke in 1855.

Stations.	Kilomètres.	Kilogrammes.	Per Train per Kilom.
Paris	206,672	1,921,700	9·2
Lille	164,714	1,729,620	10·6

PASSENGER LOCOMOTIVES, WORKING WITH

Coal in 1855.

Stations.	Kilomètres.	Kilogrammes.	Per Train per Kilom.
Paris	44,084	362,400	8·1
Lille	12,977	131,710	10·0

Coke in 1854.

Stations.	Kilomètres.	Kilogrammes.	Per Train per Kilom.
Paris	39,120	379,720	9·7
Lille	11,050	108,960	9·9

MIXED ENGINES—LARGE GRATES.

Coal in 1855.

Station.	Kilomètres.	Kilogrammes.	Per Train per Kilom.
Paris	7,088	50,792	7·2

Coke in 1855.

Station.	Kilomètres.	Kilogrammes.	Per Train per Kilom.
Paris	26,330	208,533	7·9

CRAMPTON'S ENGINES—BAGGAGE.

Coal in 1855.

Stations.	Kilomètres.	Kilogrammes.	Per Train per Kilom.
Paris	72,217	526,492	7·3
Amiens ..	22,824	166,687	7·3
Lille	39,525	283,988	7·1

Coke in 1855.

Stations.	Kilomètres.	Kilogrammes.	Per Train per Kilom.
Paris	217,377	1,621,986	7·5
Amiens ..	122,659	1,009,940	8·2
Lille	86,125	627,396	7·2

CRAMPTON'S PASSENGER ENGINES.

Coal in 1855.

Stations.	Kilomètres.	Kilogrammes.	Per Train per Kilom.
Paris	60,745	446,414	7·3
Amiens ..	22,824	166,687	7·3
Lille	37,718	269,725	7·1

Coke in 1854.

Stations.	Kilomètres.	Kilogrammes.	Per Train per Kilom.
Paris	60,064	452,519	7·5
Amiens ..	24,114	199,172	8·2
Lille	269,725	289,526*	7·5

PASSENGER ENGINES—SMALL GRATES.

Coal in 1855.

Station.	Kilomètres.	Kilogrammes.	Per Train per Kilom.
Paris	21,644	148,944	6·9

Coke in 1855.

Station.	Kilomètres.	Kilogrammes.	Per Train per Kilom.
Paris	146,701	1,127,032	7·6

The same advantageous results were produced upon the Orleans line with the locomotives from the stations of Paris, Ivry, and Bordeaux; but, in consequence of the bad quality of the coals used at the stations of Orleans and Tours, the results there were not so favourable. On the Northern Railway the best results were obtained with the baggage engines; and the average economy obtained with that class of engines, when coal was used, in 1855, was not less than from 20 to 27 per 100; in 1854 it was rather less, but even then it was between 12 and 15 per 100. If the com-

* There is evidently some error in this last table.

parison be also made from month to month, the same law will appear to hold, according to the following table of the working of heavy engines:—

	Coal in 1855.	*Coke in* 1854.
April, average per train per kilomètre	12·6 k.....	16·2 k.
May " "	13·7 k.....	15·4 k.
June " "	13·5 k.....	14·6 k.
July " "	12·4 k.....	14·6 k.
August " "	12·1 k.....	14·3 k.
September " "	12·1 k.....	14·1 k.
October " "	13·4 k.....	15·6 k.
Average of all..	12·7 k.....	14·6 k.

With ordinary grates it is difficult to work with coal only; and, as was said before, a mixture of 1/5th of coke was found to answer best. Under these circumstances, less fuel was burnt than when coal alone was used, but still more than when the stepped grates were introduced; the economy is therefore to be ascribed to the latter. With all the various systems of engines used on the Northern Railway of France, these advantageous results were obtained, but they were most decidedly marked with the baggage engines. At the Bordeaux station of the Orleans Railway the economy was even 21 per 100; but in that case the best Cardiff coal was used, and the coke was of a very inferior description. It is also important to observe, that the direct heating surface of the grate is less in the case of the stepped grates than in the ordinary ones, which of course must tend to render the comparison more unfavourable to the former, not only on account of the diminution of the surface of radiating heat, but also on account of the disturbance thus produced in the relative proportions of the radiating and communicative heat, conditions particularly unfavourable for the economical use of coal. It is therefore to be hoped that further economy will be attained by increasing the size of the grates.

In the course of the ten months during which the locomotives of the Northern Railway have burnt coal exclusively, it has not been observed that the tubes became more rapidly or more seriously affected than when coke was used. The fire-bars are, it is true, more rapidly destroyed, but the increase of expense on this score is insignificant.

Finally, the application of the stepped grates allows the advantageous use of coal in locomotives. With free-burning coals the smoke is entirely burnt (prevented), and they may be used for passenger trains without inconvenience; with baggage engines the smoke would not be so objectionable, and almost any description of coal might be used in them. The service of locomotives worked by coal was excellent during the months of November and December, for there was not a single one which was delayed on account of the bad quality of the combustible, whilst the locomotives which burnt coke were often delayed by that accident. The use of coal will in future obviate this danger.

The consumption per train and per kilomètre is less when coal is burnt than when coke is the fuel adopted; with certain descriptions of engines this economy may even attain 27 per 100. The economy which may be realised will vary with the system of engine, the nature of the coal used, and the relative values of both coke and coal. On the Northern Railway, upon a total distance run by baggage and passenger engines equal to about 696,778 miles, the economy obtained since the stepped grates have been used was nearly £5964. During the month of December, with 62 locomotives, an economy of about £1430 has been realised. The authors of this notice may well say, if they be true, that the figures given require no further comment. The whole question merits very serious examination; for, as our respected correspondent, Mr. Lewis Thompson, has shown that the calorific powers of coal are superior to those of coke, it must be desirable to substitute the former wherever it can be done without inconvenience. In England this question has been treated with singular apathy; probably because coal is so cheap that we are tempted to waste it.

COKE.

By J. O. N. Rutter, Esq.

What is to be done with the coke?—This question is constantly forcing itself upon the attention, and awakening the anxieties of those who are engaged in the management of gas-works. Sell it—is the readiest, and, as might be supposed, the only appropriate reply to the inquiry. To an ordinary observer such an answer would commend itself for its brevity as well as its simplicity. What other reply *can* be given? In a commercial sense, I know of no other. To give away, to destroy, or to attempt to keep for an indefinite period, coke—the product of gas manufacture—would be a violation of the commonly-received principles of commerce. What other means can be devised for getting rid of it, but to sell it? It is well known, however, that coke does not sell so readily, nor realise such good prices, as it did some 10 or 20 years since. Why is this? Has the demand for coke abated? Is coal so much cheaper as to have driven it from the market? Are the efforts of the Legislature to enforce the uses of smokeless fuel unavailing? No. The uses of coke are better understood, and are more general in many manufacturing processes, than at any former period. For domestic purposes, coke is also extensively used. The prices of coal are not sufficiently low to take the place of coke as an economical fuel. The legislative enactments relating to the consumption and prevention of smoke, have had the effect of very materially increasing the sale of coke.

How is it to be accounted for that it is now so difficult to sell coke, even at greatly-reduced prices? *Because the supply has outgrown the demand.* The use of gas has increased more rapidly than that of coke. Many successful efforts have been put forth in diffusing a knowledge of the benefits of gas-light; but there has not been anything like the same amount of effort in making known the uses and advantages of gas-coke. Hundreds and thousands of families, who are enjoying the comfort and economy of well-lighted apartments, still require to be informed that the same apartments may be economically warmed by means of coke fires.

What I am going further to say on this subject is not intended as advice, but only by way of suggestion; in the hope that it may set the managers of gas-works not only thinking, but acting. My remarks will probably be more applicable to provincial than to metropolitan works; to large stations rather than small ones; and they will refer especially to the districts which receive their supplies of coal from the north of England, commonly called Newcastle coal.

Something should be done to create and to sustain a greater demand for coke. We must no longer be dependent upon the uncertainties of the seasons, the changes in the temperature, or occasional variations in the prices of coal, or the cost of freight. The time was, that a snow-storm, a few days of sharp frost, or two or three weeks of stormy weather or contrary winds, was sufficient to clear out the stocks of coke, however large, from all the gas-works in the kingdom. This system is at an end; partly through the instrumentality of railways, screw-colliers, and a fleet of clippers; and partly because the consumption of coke has not increased so quickly as its production.

What is to be done? The coke *must* be sold. How is its sale to be effected? Not, as I believe, by any sudden or special effort; but by the steady, continuous, and untiring application of a combination of efforts.

Gas companies should take the initiative in making the properties, the best means of purchasing and of using, and the real saving in the cost of coke as compared with coal, more generally known. To open the yard, and expose coke for sale, is not all that is required. Those who are most in need of cheap fuel at all seasons, but especially in winter, should be invited to become purchasers. Whilst every kind of encouragement, by difference in price, should be given to hawkers and other small dealers, who convey coke to the houses of those who are unable to fetch it for themselves, I think all classes of customers should be kept informed of the current price at the works.

In provincial towns, the local press will diffuse information: but these means are not sufficient. We get access to the central parts of society; but not the extremities. To reach these, the press, in another form, must be employed; handbills and circulars being distributed broad-cast.

By reason of its conveniences, its safety, and its cheapness, gas has long since left the abodes of luxury to be reckoned among the necessaries of life. Coke ought to be—and it must be—included in the same list.

What is wanted is, that the advantages of coke should be so well understood as that it might become an every-day fuel; be as regularly in demand as coal; and in most houses constitute the principal article of fuel at all seasons, and in every department of the domestic arrangements.

How is this to be accomplished? Not merely by telling people that coke is cheap, but by letting them know it, and enabling them to prove it, by actual practice. The price of the best kinds of Newcastle coal, in each locality, will always be a safe guide in determining the value of coke. If coke is to take its place alongside of coal as a necessary of life, it must be done not only by relative but by actual cheapness. There never will be any difficulty in ascertaining the price at which coal reaches the house of the consumer. There need be no difficulty in fixing the price of coke, so that it might be cheaper than coal.

Coal merchants, and others interested in the trade, must not be overlooked. They should be fairly treated, and charged at such rates according to the quantities purchased, and other circumstances, as shall insure their co-operation.

By thus selling coke at a low rate—by which is meant at such prices as that it shall always be a cheaper fuel than coal—are gas companies likely to be losers? I think not. If all the coke produced could be sold when it was newly made, a reduction equal to one-fourth, or even more, in the ordinary current price, would be no real loss. If we take into account the charges upon coke for labour of trimming and stacking, and the removal of breeze; if we reckon the deterioration and waste by exposure to the weather, and the prices realised when the stock is too large and sales are forced; will there not be many inducements to sell it all at lower rates, if the demand be thereby so greatly increased as to prevent waste, and save the cost of extra labour?

Register of New Patents.

1468. GOLDSWORTHY GURNEY, of Bude, Cornwall, for "*Certain improvements in warming and moistening air.*" Patent dated June 23, 1856.

This apparatus is constructed to apply the laws of conduction and convection of heat for the purposes of warming and moistening air. The apparatus consists of a metallic vessel, having a number of plates extending from its outer surface, standing with the plates vertical in a shallow trough of water. Heat is communicated to the interior of the apparatus by hot water, steam, or fire, and from thence, under the laws of conduction, passes into the plates on the outside; part of the heat from the plates is communicated to the water in the trough below, and part to the air between them above. As the water becomes warmed, the vapour escaping from its surface passes up into the air contained in the spaces between the plates.

The air in combination with vapour receives heat more rapidly from the warmed surfaces of the plates than it otherwise would do, and moves upwards with an increased velocity directly as its increased temperature; under the laws of convection, it is communicated to the atmosphere above. The portion of evaporation escaping from the trough which may not be drawn into the upcast column between the plates rises directly and moistens the atmosphere above.

It is to be understood that the form of the apparatus may be varied, but it is preferred that it should be cylindrical, with a series of radiating projecting plates on the exterior surface rising from the lower part upwards.

This apparatus is constructed of a cylinder of cast-iron or other metal, with numerous radial plates cast on and projecting therefrom, forming part therewith, at the bottom of which is a trough or vessel to contain water. The cylinder and its radial plates may be made in one casting, when the apparatus is small; but when large, it is preferred that it should be made in several sections to go together, and may be fixed by screw-bolts and nuts. The interior apparatus may be heated by a fire, gas, hot water, or steam. When using a fire, the fuel is supplied through the top by removing for the purpose a moveable cover. The air to supply the fire is admitted through the ash-pit doorway, placed below in brickwork, as is well understood. There is an outlet or flue leading to a chimney for the passage of the heated products of combustion. By this arrangement the heat on the inside will be conducted into the vertical plates, and then part of it downwards into the water in the trough or vessel, and the amount of vapour arising therefrom will be in proportion to the quantity of heat thus transmitted by conduction; the effect will be that the vapour, as it escapes from the water in the trough, will mix with the air above, and pass up in combination between the outer heated surface of the vessel and the radial projecting plates; here it will be dissolved and assume the gaseous state; by virtue of the laws of diffusion of gases, the vapour and water in solution will be more extensively and uniformly diffused throughout the surrounding atmosphere of the room or place where the apparatus is placed; under the laws of convection, it will rapidly carry and part with its increased temperature uniformly to a distance from and near the apparatus, which is a result very different from what takes place when dry air alone becomes heated by a stove or other heating surface; and it is the constructing apparatus as above described, with a trough for water at the lower part thereof, which constitutes the peculiarity of this invention.

PROVISIONAL PROTECTION

HAS BEEN GRANTED FOR THE UNDERMENTIONED PATENTS.

2580.—EUGÈNE NAPOLÉON CADET, of 36, Rue Folie, Méricourt, Paris, manufacturer, for "*Improvements in the construction of cocks and taps.*" Nov. 3, 1856.

2756.—CARL HEINRICH JULIUS WILHEM MAXIMILIAN LIEBMANN, of Fartown, Huddersfield, York, warehouseman, for "*Improvements in the purification of water, and in the reparation of materials employed therein.*" Nov. 21, 1856.

2932.—JOSEPH CHATWIN, of Birmingham, Warwickshire, gas fitting and lamp manufacturer, for "*An expanding compensating slide, for sustaining gas and other lights; also applicable for other similar purposes.*" Dec. 11, 1856.

3046.—ALEXANDER ROSS, blacksmith, The Burn, Fettercairn, JAMES VALLENTINE, factor on the estate of The Burn, residing at Woodmyre Cottage, parish of Fettercairn, ALEXANDER MURRAY, teacher of the Free Church School, Fettercairn, and ALEXANDER DON, general merchant, all in Kincardineshire, for "*Certain improvements in the purification of coal gas, the residuum of such purifying process being applicable either as a manure, or for manufacturing gas from.*" Dec. 23, 1856.

170.—THOMAS BOYLE, of 1, Pilgrim Street, Ludgate Hill, London, for "*Improvements in outside reflecting lanterns.*" Jan. 20, 1857.

196.—ERNST LUEDEKE, of Raglan Terrace, Robin Hood Street, Nottingham, for "*Improvements in obtaining power when steam, gas, or air is used.*" Jan. 22, 1857.

257.—GEORGE FERGUSON WILSON, of Belmont, Vauxhall, London, for "*Improvements in treating Burmese and such like petroleum.*" Jan. 28, 1857.

269.—JAMES FARRAR, of Bury, in the co. of Lancaster, agent, for "*Improvements in apparatus for regulating the pressure and flow of gas.*" Jan. 30, 1857.

NOTICES HAVE BEEN GIVEN OF INTENTION TO PROCEED WITH THE UNDERMENTIONED PATENTS.

2354.—WILLIAM BRADFORD, of the city of Manchester, in the co. of Lancashire, brass-founder and gas-fitter, for "*Improvements in the arrangement of gas-burners for lighting and ventilating.*" Oct. 8, 1856.

2547.—JOHN THOMAS WAY, of Welbeck Street, in the co. of Middlesex, for "*Improvements in obtaining light by electricity.*" Oct. 29, 1856.

3105.—WILLIAM M'CULLOCH, of Kilmarnock, in the co. of Ayr, North Britain, plumber, and THOMAS KENNEDY, of the same place, watermeter maker, for "*Improvements in stop-cocks and valves.*" Dec. 31, 1856.

90.—FRANCIS XAVIER KUKLA, of Raven Row, Mile End Gate, London, for "*Improvements in apparatus for heating stoves by gas.*" Jan. 10, 1857.

98.—GEORGE FERGUSON WILSON, of Belmont, Vauxhall, London, for "*Improvements in treating Burmese and such like petroleum, and their products.*" Jan. 12, 1857.

102.—GEORGE ESKHOLME and HENRY WILKES, both of Rotherham, in the co. of York, engineers, for "*Improvements in apparatus for preventing waste of water from service-pipes and cisterns.*" Jan. 12, 1857.

147.—ANDREW STEINMETZ, barrister-at-law, of the Middle Temple, and 20, Edith Villas, North End, Fulham, Middlesex, for "*Improvements in circular gas-burners and their chimneys (to be called 'the Steinmetz burner and Steinmetz chimney').*" Jan. 17, 1857.

207.—GEORGE ESKHOLME, of Rotherham, in the co. of York, and HENRY WILKES, of the same place, brass-founder, for "*Improvements in ball and other cocks.*" Jan. 23, 1857.

257.—GEORGE FERGUSON WILSON, of Belmont, Vauxhall, London, for "*Improvements in treating Burmese and such like petroleum.*" Jan. 28, 1857.

Miscellaneous News.

CHESTER UNITED GAS COMPANY (LIMITED).

The first Annual General Meeting of the shareholders in this company was held on Wednesday, the 29th ultimo, at the Cuppin Street Station, E. G. Salisbury, Esq., in the chair. The attendance was large and respectable.

The CHAIRMAN said that their solicitor, Mr. W. H. Brown, was unable to attend the meeting in consequence of ill health, and in his absence he would call on the secretary to read the notice convening the meeting.

The seal of the company was attached to the register of shareholders; and the secretary, by the direction of the chairman, read the following report:—

The Chester United Gas Company (Limited) having been incorporated under the provisions of the Joint-Stock Companies' Act, 1856, commenced trading on the 1st day of September last. The entire works, plant, mains, meters, &c., of the dissolved Chester Gaslight and Roodee Gas Companies, passed by assignment to the New Company on that day, and were represented by the capital stock and borrowed money then standing in the company's books as the amount of purchase-money, viz.:—

£40,000 in 4000 shares of £10 each, paid up in full.

£10,000, amount borrowed under clause 56 in the "Articles of Association."

The directors purchased at a valuation the stock of cannel coal, coke, fittings, &c., which they had agreed to take from the dissolved companies, and proceeded, without delay, to convert the whole to the purposes of this company. Having taken the advice of Alfred King, Esq., of Liverpool, upon the matter, they have expended the sum of £5115. 10s. 4d. in adding to and altering existing works, with a view to a better return upon the invested capital and a more satisfactory supply of gas to the entire borough; it will take some months, however, to complete these new arrangements, but the directors confidently hope that, before the autumn of 1857, there will be an ample supply of gas at their disposal under one fair and uniform pressure throughout the districts. The capital required for these alterations will be provided out of the proceeds of 800 additional shares issued. A deposit of £3 per share has been paid in December upon *seven hundred* of these shares, and the other *hundred* have since been taken up; but these 800 shares will not rate for dividend until 1857.

The Chester Gaslight Company had a running contract for Lancashire coal, and the Roodee Gas Company for Holywell cannel, to which your directors took. They have since purchased from the Ince Hall Company 5000 tons of their best Lancashire cannel, and from the Coleshill Hall Company about 1500 additional tons of Holywell cannel. They have hitherto worked one-half coal and one-half cannel in the manufacture of gas, and purpose continuing this arrangement, as the best adapted for the district they have to light, and in the end the most profitable to the company.

The Right Worshipful the Mayor of Chester having accepted the seat at your board, placed at his disposal by clause 41 in the "Articles of Association," your directors appointed him a member of each committee nominated by them for business purposes, so as to give him every opportunity of ascertaining for himself, as the representative of the town, the entire working of the undertaking; and the treasurer for the borough of Chester has been invited to examine the company's accounts on behalf of the town council.

The directors annex hereto a general statement of the company's accounts, made up to the 31st day of December last, with the auditor's report thereon, and they have merely to add here the result of four months' working, viz., from the 1st of September to the 31st of December, 1856, with a view of recommending a dividend upon the paid-up capital of the company on the latter date.

The sum realised for gas sold by meter and from public lamps, during that period, is		£3383	6 9
The sum realised by sale of coke, tar, waste lime, and other residuum, is		343	15 6
		£3727	2 3
The cost of manufacture and interest on borrowed money is as follows:—			
For cannel and coal	£1607 17 11		
Management and wages to stokers and other labourers	533 13 11		
Salaries and other office expenses	170 19 4		
Interest on loans and bank commission	170 4 10		
Rates, taxes, and insurance	61 15 0		
For time required for purification of gas	59 13 2		
Rent of Cuppin Street Station	46 13 4		
		£2650	17 6
Leaving a profit of		£1076	4 9

The directors recommend that a dividend of 4s. per share (exclusive of income-tax) be at once paid upon the 4000 paid-up shares in the company on the 31st day of December last, being at the rate of 6 per cent. per annum upon £40,000 paid-up capital on that day; and the balance of £276. 4s. 9d. has been carried to the "Reserve Fund Account" of the company, to provide for any emergency that may arise at any future time, and to meet the provisions of the "Articles of Association" in that respect made and provided.

The meter account of the company is kept distinct from the ordinary working account, and inspectors are appointed to visit with regularity the meters of the consumers, and see that they are in a satisfactory state of repair. The expenses incurred in this way are carried to the debit of meter account, and all meter-rents to its credit; and there remained on the 31st day of December last a credit balance on that account of £139. 12s. 2d., which the directors have carried to the "Reserve Fund Account." There was also a sum of £312. 3s. 8d. to the credit of "Stock Account," being the difference between the values of stock purchased from the late gas companies, as per valuation already referred to, and its present marketable value; and this amount is carried to the "Reserve Fund Account," making that account creditor on the 31st of December, 1856, £728. 0s. 7d.

It is proper that the shareholders should, at this their first ordinary meeting, be informed that the directors believe they may calculate upon a dividend of 6 per cent. per annum on the invested capital, leaving every year a fair sum out of profits to go to the "Reserve Fund Account," until that account is full, when the entire earnings of the company can be divided among the shareholders. The directors are anxious that this arrangement should be carried out in its integrity, because they are desirous on the one hand not to increase their capital unnecessarily, and on the other to provide for future extension of mains and a supply of gas in every part of the borough, without trenching upon the fair divisible earnings of the undertaking.

A list of the shareholders on the 31st day of December last is annexed, with their respective holdings in the company; and, agreeably with clause 45 in the "Articles of Association," all the directors retire from office at this meeting. It is for the shareholders to select *nine* gentlemen to fill up the vacancies thus occasioned. The retiring directors are eligible for re-election. Clause 41 in the "Articles of Association" will show the needful qualification for the office of director, which, with the list already alluded to, will enable the shareholders to comply with the requirements of the law in this matter. (Signed) E. G. SALISBURY, Chairman.
Chester, January 21, 1857. JAMES PYE, Secretary.

The CHAIRMAN then addressed the meeting, and said that the balance-sheet referred to in the report had been sent, in accordance with the requirements of the law, to each shareholder; but, if it was wished, it might then be read, or taken as read. [No one expressed a wish for it to be read.] He (the chairman) then proceeded to say that he regretted to have to make the intimation that his Worship the Mayor was unable to be present at this meeting in consequence of indisposition, but that he had followed the example of his excellent predecessor in office, and taken the seat allotted to him at this board. Gentlemen (said the chairman), I congratulate you most heartily upon our present meeting. Many of you now present had been connected with the dissolved companies for years, and felt by sad experience the unhappy results of unwise and unnecessary competition. You can the more fully, therefore, appreciate the altered state of things indicated in the report just read; and, although the past four months' working may not be altogether a fair criterion of the future, we may, at all events, conclude that we have a prospect of earning a fair, if not a liberal, return upon the large outlay of money which has been made to extend the gas undertaking in Chester. On the one hand, the delay occasioned by the deliberations of the council in the discussion of the gas amalgamation itself, and afterwards in permitting us to carry a main across the Roodee from our lower to our upper station, and the disadvantage incident to alteration of mains during the autumnal months, coupled with the necessity consequent thereon of working at this station as well as at the Roodee, has tended to moderate our earnings, and to increase our expenditure in a way which I trust may not again occur. We hope in a few more weeks to be able to close this station altogether for manufacturing purposes, and to save materially in the cost of making gas. On the other hand, it must not be forgotten that the four past months are the very best months in the year for consumption, and that, although the spring period should secure for the company almost as large a return, the summer months will be to us, as to all gas companies, a period, if not of absolute loss, of little, if any, profit. We shall, however, possess one advantage during the year 1857 which we did not possess in 1856—we can manufacture all our gas in one place; and I rejoice to say that we have at this moment at our Roodee station retorts sufficient for an increase of consumption equivalent to almost our present entire make. (Applause.) The outlay of money upon the works, though large, is, I believe, one that will make our works one of the best and most perfect establishments of its kind in the kingdom. We have acted throughout under the advice of Mr. Alfred King, of Liverpool, a gentleman who stands unrivalled as a gas engineer, and whose character is a sure guarantee that what he commends is commendable. The sum of £5115. 10s. 4d. has been spent by the directors, between July and December, upon new buildings at the Roodee, new and admirable purifiers, new mains, and the taking up of old mains and old services. I am sorry to say that as far as the latter experiment is concerned, it has been a losing one in one sense. We expected that the produce of old mains taken up would not only have paid the cost of removal, but left us a surplus. The result has been the other way. The cost of removal and re-arrangement has far exceeded the amount produced to the company by their sale. In another point of view, however, the result has been most gratifying, for the 33¼ leakage, at which the old company stood, has been reduced to 18 per cent. by this step, and the directors confidently hope that this may be still further reduced during the current year. (Cheers.) As to future outlay on capital account, I am sorry to say that we cannot at present pledge ourselves to any positive amount; but from a pretty careful examination of our wants, and of the probable amount we may receive for old purifiers, condensers, and other material we have to dispose of, an outlay of about £1800 during 1857 will, I think, perfect all our plans for the next four or five years, leaving our capital account at the end of the year at £47,000, and our borrowed money at £10,000. A word or two will suffice as to our working account. You will see, on reference to the accounts, that our profits on the manufacture of gas (which is our business) for the past four months is £1076. 4s. 9d., the credit balance on meter account is £139. 12s. 2d., and the credit balance on stock account is £312. 3s. 8d., making our apparent gain for the period named £1528. 7d., out of which sum the directors have recommended a dividend at the rate of 6 per cent. per annum upon the sum of £40,000 paid up capital on the 31st day of December last, leaving the sum of £728. 7d. to carry over to the "Reserve Fund Account," which we opened on that day under the powers reserved to us in our "Articles of Association." The gain on stock account is explained in the report, and may never occur again. That is an item, therefore, which cannot fairly be divided. The credit on meter account is the same, for our meters are depreciating in value daily, and require a constant outlay for repairs, which cannot come from capital, and which should not come from working profits. That amount, therefore, goes for reserve; and as we wish to fill up our reserve, using the amount in paying off borrowed money, and the income accruing therefrom in the maintenance of our plant, I trust the shareholders will agree to our plan, and appropriate all we can over 6 per cent. to the objects just indicated. The demand for gas is ever increasing. In 1852, the entire receipts of the old company for the year came to £3677. 16s. 5d. Our receipts for four months only in 1856 came to £3627. 2s. 3d.; and I think that in another year we may set down our returns at a gross sum of £10,000, with increasing profits. I should like to make a few further remarks upon the balance-sheet, but do not wish to detain you; but I cannot sit down without alluding to the insidious efforts of ill-disposed persons to injure our credit with the public. I know of two individuals who have industriously spread the report that we make our gas from the worst Welsh coal. That statement is false. We have not had one ton of Welsh coal in our yard since the formation of the company—(hear, hear)—not because I object to the use of Welsh coal, some seams of which are admirably adapted for gas making, but because we have a running contract for Lancashire coal, which will supply all our requirements for the next two years. To enable you, however, to deny any such statements as the one alluded to, I have obtained from our secretary a return of the coal and cannel used by us during the four months' working of 1856, and find that we used 99 tons of Holywell cannel, 982 tons of Lancashire gas coal, and 1155 tons of Lancashire cannel. The statement made by the parties alluded to is, therefore, a malicious slander. (Cheers.) I must also state that the quality of the gas supplied is superior to anything supplied from either of the works since 1853, and is far above the ordinary standard fixed by Parliament. It is right that it should at the same time be stated that the supply has not been satisfactory in all places, but that has arisen from the causes alluded to already, and will be remedied as soon as possible. I hope that when all get plenty of gas they will not then turn round and say how astonishingly high their gas bills have run up to since the amalgamation. (Laughter.) Our meter rents are at least one-third lower than is paid by the majority of consumers in other places; and it should be understood that although we provide meters at a rental, we do not wish our consumers to rent ours—they may buy their own. All we require is that all meters are subjected to a proper tast, and can be examined at pleasure. I should also state that the undertaking we gave to the city before the amalgamation took place, as to offering shares to consumers, has been faithfully fulfilled. We advertised our new shares in the Chester papers for weeks, and we sent circular letters to 500 of our consumers, offering these shares at par. The *two hundred* shares which we had retained for the company we have decided upon allotting to consumers, seeing that there is now a demand for them; and, personally, I am more willing to reduce my holding than to add to it, if by doing so we can the better satisfy the requirements of those who may feel that they have some sort of claim upon us. I say all this to you that it may not be said hereafter we have made the company a close borough, and when we may deem it wise to apply to Parliament for special powers, which cannot otherwise be obtained, the fact just alluded to will have its due weight with gentlemen who permit neither local prejudices nor petty jealousies to influence them in the discharge of duties confided to them by the nation. In conclusion I would say, that if any shareholder wishes for information on matters alluded to in the report or otherwise, I shall be happy, on behalf of my colleagues, to give every opportunity for this purpose. (Cheers.)

Mr. THOMAS ROBERTS: How does the agreement stand between the company and the corporation?

The CHAIRMAN: The Roodee Gas Company had an unexpired term for lighting the borough of 16 years from September last, and, in the event of the corporation not buying the company's works, an extended period of 21 years from 1872; but the deed to which I am alluding contained a covenant on the part of the company, that an amalgamation of the two gas companies should not take place without the consent of the corporation. That consent was obtained in April last, and certain new conditions were imposed by way of consideration for the privilege accorded. These conditions should have been reduced into a deed, with covenants of a mutual nature for observance, &c. We have waited for some time past in expectation of a demand from the council for a ratification and exchange of deeds. In December last, Mr. Brown was supplied with a draft deed by Mr. Walker, purporting to be in accordance with the resolution of the council; but, on examination, we find it utterly opposed, in many respects, to the letter and spirit of the resolution just alluded to, and, under Mr. Brown's advice, and with my full concurrence, the directors declined accepting that draft as the terms of agreement between the two corporations. (Cheers.) We have kept faith with the council; we have admitted their chief to our board, and hailed his presence with satisfaction; we have given the treasurer every facility for the examination of our accounts; and we are ready and willing to fulfil our part of the agreement to the letter. Beyond that we should not be asked to go; beyond that we shall not go. (Hear, hear.) I believe the town council, as a body, will not ask us to do more. They have met us in a frank spirit hitherto, and I do trust that we shall go on hereafter in cordial unison with them, without detriment to our own material interests. (Applause.)

The CHAIRMAM then moved, "That the report now read, with the statement of accounts annexed thereto, be received, adopted, printed, and circulated among the shareholders, and that the directors take such steps as they may deem best for giving the same publicity."

THOMAS DIXON, Esq., had great pleasure in seconding the resolution, and felt that they ought to offer their best thanks to Mr. Salisbury for the manner in which he had brought the company to the state in which it was at the present time. (Cheers.)

The resolution was carried unanimously.

The CHAIRMAN next moved, "That a dividend of 4s. per share (free of income tax) upon the paid-up shares in the company on the 31st day of December last, be and hereby is declared, and that the same be paid at Messrs. Dixons' and Wardell's bank, Chester, on Thursday, the 19th day of February next."

GEORGE ALLENDER, Esq., seconded the resolution, remarking that it was the best thing he had done for some time past. (Laughter.)

Carried unanimously.

It was then intimated that by the "Articles of Association," the first directors of the company must retire from office at the present meeting, and that the next business was the election of nine new directors, whereupon—

C. BENTHAM, Esq., moved, that Enoch Gibbon Salisbury, George Allender, and John Williams, Esqrs., be elected directors of the company.

JOHN CLEMISON, Esq., seconded this resolution, which was carried by acclamation.

THOMAS ROBERTS, Esq., proposed, and Mr. R. NICHOLSON seconded, the election of Freeman Leepold Bagnall, John B. Wilcox, and Thomas G. Frost, Esqrs., as directors, which was also carried.

Mr. JAMES HARRISON proposed, and Mr. JOHN TURNER seconded the election of Thomas Dixon, Esq., John Hignett, Esq., and Joseph Harger, Esq., as directors, which was carried unanimously.

The CHAIRMAN thanked the shareholders on his own and co-directors behalf for the confidence reposed in them, and said—You will pardon me for saying a word or two on the next resolution, as it affects me personally more than the other gentlemen sitting at your board. Mr. Dixon, Mr. Bentham, and others present, have very kindly alluded to my services in connection with the amalgamation of the two dissolved gas companies. I wished to retire at this meeting from the management of the undertaking, and with your approval handing it over to the new directors as a valuable inheritance, but my friends at the board would not listen to this. I urged the necessity which existed for attention to my professional calling, and that although my stake was large in this company, I had other claims upon my attention which should not be neglected too long; and that if I consented to remain in office another year, it must be with the understanding that some pay should be attached to the post of chairman. I left the matter in their hands, and they have been good enough to say that if you will approve of the resolution thus submitted to you, they will appropriate the greater part of the vote as a remuneration for my services, and I am willing to leave myself in your hands.

Mr. JOHN HIGGINS then proposed—"That the sum of £100 be allowed to the retiring directors out of the reserve fund, and £10. 10s. to the retiring auditor out of the same fund, for their past services; and that the sum of £500 be placed at the disposal of the new board for the year 1857."

Mr. J. G. WILLIAMS, Frodsham, had great pleasure in seconding the resolution.

Mr. ALLENDER said: I cannot allow this resolution to pass without saying that, although the sums asked might appear large, it would be folly in them to attempt to carry on the affairs of the company in its present state without the services of Mr. Salisbury: he was engaged at the works almost day and night, and when the directors considered the matter in his absence, they came to the unanimous conclusion that the sum named was by no means too great for him. He wished also to say that the auditor had paid great attention to

their accounts, and that, although the company had only been in existence for four months, they had decided to give their auditor six months pay.

Mr. BENTHAM: We must have a head. We cannot find a better one than the gentleman who is now in the chair; and when they consider the efficient manner in which that gentleman had managed the whole affairs of the company from the first, I think every one will agree with me in the view I have taken, and that we will carry the resolution with unanimity.

The resolution was adopted with loud cheers.

F. L. BAGNALL, Esq., moved the appointment of Mr. John Jones, Westminster Buildings, as auditor of the current year, at a salary of £21.

JOHN HIGNETT, Esq., seconded the resolution, and the chairman, in putting it to the meeting, said he was a most efficient auditor. He vouched every account, examined all the books, and did the company credit in every way. The treasurer and secretary had been directed to give Mr. Jones every possible aid and facility; and the same remark applied to Mr. Roberts, the borough treasurer, who had undertaken the audit on behalf of the corporation. Carried unanimously.

THOMAS ROBERTS, Esq., proposed, and Mr. J. G. WILLIAMS seconded, the confirmation of the appointments made by the directors to the offices of treasurer and secretary, which was carried; and the meeting was brought to a close by thanks to the chairman, on the motion of THOMAS DIXON, Esq., seconded by JOHN CLEMISON, Esq.

PUBLIC LIGHTING IN SOUTHWARK.

The Vestry of St. George the Martyr met in committee on the evening of the 2nd inst., to consider the subject of the gas contracts.

The CLERK (Mr. F. Tritton) read the letters which he had received from other vestries and district boards, in reply to communications sent out by himself to those bodies, inquiring whether they would co-operate with this vestry in endeavouring to obtain a supply of gas to the public lamps at a moderate price, and also inquiring what were the prices paid for gas by those bodies. Answers had been received to the following effect, the prices being the charge for each lamp per annum :—

"Greenwich District Board of Works, £4. 15s. and £3. 18s., the parishes being at the expense of lighting and extinguishing the lamps, and keeping the lamp-posts in order. Were willing to co-operate.

"Woolwich Local Board.—Required information from the St. George's Vestry.

"Lambeth Vestry.—London Gas Company, £4. 15s.; Phœnix, £4. 17s. 6d.; South Metropolitan, £4. 18s. 6d.; Crystal Palace Gas Company, £5 5s. Willing to co-operate.

"Rotherhithe Vestry.—Lit with naptha. Contemplated a change.

"St. Saviour's District Board of Works.—Clink Liberty, £4. and £2. 10s.; Christchurch, £4. 15s. Willing to co-operate.

"Vestry of St. Giles, Camberwell.—South Metropolitan Gas Company, and a few lamps by the Phœnix, £4. 4s., £4. 15s., and £5. Willing to co-operate.

"Vestry of St. Mary, Newington.—£5., £4., and a few small burners at £2. 10s. Willing to co-operate.

"Vestry of St. Mary, Bermondsey.—Surrey Consumers' Gas Company, £4. Contract has 4½ years to run. A penalty of 10s. per night for each lamp not properly lit.

"Wandsworth District Board of Works. — Battersey parish—Phœnix, £5. 12s. 6d.; London, £5. 15s.; Wandsworth Gas Company, £5. 5s. Clapham parish—Phœnix, £5; South Metropolitan, £5. Putney parish—Wandsworth Gas Company, £5. 5s.; Brentford Gas Company, £5. 5s. Wandsworth parish—Wandsworth Gas Company, £5. 5s. Streatham Road—Phœnix, £5. 5s. Streatham side-roads—Phœnix, £6; South Metropolitan, £5; Mitcham Gas Company, £6. 15s. 6d. Tooting—Mitcham Gas Company, £6. 15s. 6d."

The CLERK stated that the present position of the parish of St. George was as follows:—Lamps lit by the Phœnix, 200 at £4. 15s.; 118 at £4; 40 at £2. 10s.; 20 at £4; 2 at £5: total, 380; average price, £4. 4s. 10d. Lamps lit by the London Gas Company, 115 at £4. 15s. Lamps lit by the South Metropolitan Gas Company, 77 at £4. Total of all the lamps, 572. Annual charge, £2466. 5s. Average price per lamp, £4. 6s. 2d. The present contract expires at Michaelmas next.

A conversational discussion ensued, in the course of which

Mr. PALMER moved that it be recommended to the vestry to offer the Phœnix Gas Company the sum of £4 per annum for the public lights, the burners to be the same as those called first-class burners in the contract between the Surrey Consumers' Gas Company and the late Commissioners of Borough Pavement; the contract to be for seven years, to be determinable by the vestry by six months' notice, to expire at the end of any one year.

Mr. PASH seconded the motion.

Mr. JONES supported the proposition.

Mr. COLLINSON put the meeting in possession of certain facts, to show that the gas companies were deriving a considerable profit from their present contracts for the public lamps.

The motion, on being put to the vote, was carried unanimously.

REPORT AND BALANCE-SHEET OF THE PHŒNIX GASLIGHT AND COKE COMPANY.

The following is the report of the directors of the Phœnix Gaslight and Coke Company, to be submitted on the 18th of February, 1857, to the proprietors, for the half year ending at Christmas, 1856:—

Your directors submit to your consideration a report of their proceedings, and the trade account during the half year ending at Christmas last; together with the balance-sheet at that period.

Your directors are glad to find that the advantages derived both from the district-ing system, and chiefly from the additional capital created by you in 1854, are now beginning to develope themselves. The rental has increased considerably, with reduced expenses: while the town consumers are being supplied with gas at 4s. 6d. per 1000, a price proportionably cheaper now (considering the present price of gas-coals, coke, and materials) than 4s. was some years ago. A reduction upon the country price has been made. The additional capital has enabled your directors to provide means of manufacturing, storing, and delivering a much greater quantity of gas than is immediately required, but not more than there is every reason to believe will shortly be required.

The large gasholder is working very satisfactorily, and has been found of great service during the winter as a store of gas against dark and foggy days. The last payment on that account has been made.

A new meter-house has been erected at the Kennington Lane Station, with its necessary requirements of station-meters, valves, governors, pressure-registers, testing-room, &c. &c. Repairs of the most substantial kind have been made in the wharf, on the creek side of the Greenwich Station; and a portion of a new 24-inch hydraulic main has been there substituted for the old one of 14 inches diameter. A new station-meter has been replaced at the Bankside Station. The alteration in the situations of the street mains (as before reported to you) has been continued.

Further extensions of mains will be required in the present year for places not hitherto lighted with gas in the Balham, Lewisham, and Blackheath districts.

Your directors recommend that a dividend on the capital at the rate of 3½ per cent. be now declared: this, with the 2½ per cent. dividend paid at Midsummer last, will make a dividend for the entire year at the rate of £6 per cent. per annum. During the last half year a net profit of £17,059. 7s. 5d. has been realised, from which, deducting the above dividend and the income-tax, being an amount of £15,759. 8s. 8d., will leave a sum of £1299. 18s. 9d. This latter sum added to the balance of £10,777. 18s. 7d., will make an undivided balance of £12,077. 17s. 4d. in hand.

Your directors have now only to resign into your hands the trust you have reposed in them during the past year, in full confidence that their exertions for the benefit of the concern will meet your cordial approval.

(Signed) J. E. JOHNSON, Chairman.

ABSTRACT OF THE TRADE ACCOUNT FOR SIX MONTHS, ENDING CHRISTMAS, 1856.

Dr.				*Cr.*		
For coals used			£25,448 6 3	By rental for light		£55,088 1 0
Tradesmen's bills, for materials supplied			6,642 17 8	Coke made for sale		11,771 3 8
Law			173 6 10	Breeze do.		217 2 3
Retorts used			432 8 0	Tar do.		991 16 1
Meter—				Ammonia		669 10 7
Repairs	£824 8 3			Interest received		395 17 1
Fixing	340 10 0					
Depreciation	586 15 7					
		1,751 13 10				
Rent, rates, and taxes		1,833 11 4				
Directors £500, auditors £21		521 0 0				
Salaries		2,383 1 0				
Wages paid		8,158 3 3				
Bad debts and overcharges		533 12 1				
Reserve for depreciation on plant and leasehold property		4,196 3 0				
Net profit		17,059 7 5				
		£69,133 10 8				£69,133 10 8

ABSTRACT OF THE BALANCE-SHEET, AT CHRISTMAS, 1856.

Dr.				*Cr.*			
For capital of 9000 shares, at £52 each			£468,000 0 0	By amount of plant at Midsummer last			£419,618 0 6
Unpaid dividends			370 0 8	Less—			
Unpaid tradesmen's bills			6,321 1 3	Reserve for depreciation of plant and leasehold property			4,196 3 0
Balance of profit and loss—							£415,421 17 6
Undivided balance	£10,777 18 7			Add—			
Half year's profit	17,059 7 5			Expended this half year in extension of works			3,047 3 11
		27,837 6 0					£418,469 1 5
				Amount due from sundries—			
				For rental—			
				Christmas quarter	£35,924 2 11		
				Arrears	2,691 14 4		
					£38,615 17 3		
				For coke	1,921 11 8		
				Breeze	127 11 6		
				Tar	772 12 3		
				Ammonia	461 0 2		
				Sundries	2,021 9 8		
						43,920 2 6	
				Stock of coals	£7,915 7 6		
				Do. coke	317 2 0		
				Do. breeze	27 5 0		
				Do. tar	152 5 0		
				Do. retorts	1,549 9 0		
				Do. meters	12,090 16 0		
				Do. ammonia	96 16 0		
						22,149 0 6	
				Balance at treasurer's	£4,990 3 6		
				Do. at interest	13,000 0 0		
						17,990 3 6	
		£502,528 7 11					£502,528 7 11

STEALING GAS IN BRISTOL.—Thomas Collings, a tin-worker, living at the Causeway, Bedminster, was brought up under a warrant, charged with stealing gas, the property of the Bristol United Gaslight Company. Mr. A. Brittain appeared for the prosecution. From the evidence of Mr. Trevett, one of the company's officers, it appeared that when he went to the prisoner's premises on Monday last he found that the meter had only registered 300 feet of gas as having been consumed by three lights from the 27th December to that day. This excited his suspicions, and observing that a portion of the service-pipe which led from the main to the meter was covered with boarding; he removed the boards, and discovered that a pipe was attached to the service-pipe, about half a yard from the meter, and was conducted to the cellar underneath, used as a workshop. He went to the cellar, but the prisoner got there before him, and he found that the light had been extinguished. The burner, however, was quite warm. He asked the prisoner who had fitted the pipe and burner, and he replied that a young man of the name of Jones did it in August last. On making a more minute examination of the piping about the meter, he found that another pipe branched out from the one that led to the cellar, and was attached to the pipe which ought properly to receive the gas from the meter and supply it to the premises. The effect of this was that the three lights could have been supplied with gas without its passing through the meter all. By this means he (the witness) should think that the Company had been robbed of several thousand feet of gas. Another officer of the company, named Melrick, having corroborated the last witness's testimony, two apprentices of the prisoner were called, who proved that they had assisted him in fitting the gas-piping and burner in the cellar, in November last, and that it had been constantly used since, as occasion required. The prisoner, in his defence, made a long statement about some alterations which he made in his gas-fittings in November last, and declared that the fixing of the pipes near the meter had been left to a young man named Jones, and that he (the prisoner) was totally ignorant of their being disconnected with the meter. Mr. Brittain applied for the committal of the prisoner, as the company were determined to make an example of him. Mr. Brice said that any one consuming gas before it passed the meter was just as guilty of felony as though they stole wine, oil, or any other commodity. The prisoner was committed for trial.

THE LIVERPOOL METER-TESTING APPARATUS.—At the meeting of the Liverpool town council, held on the 9th inst., the gas committee proceedings were read. Mr. King, on the part of the Gas Company, had objected to the testing apparatus, as not sufficiently accurate for the purpose for which it was intended. Mr. Kitchen moved the confirmation of the proceedings. Mr. Bennett said he believed the limit of deviation from the true correctness of the meters was 1 per cent. either way; and he understood that the apparatus was more in error than the meters which they had to test. Mr. Kitchen said that the apparatus was perfectly correct by the London test, but the Gas Company said that they were not so by the Liverpool standard. A third party—to decide the difference—would have to be called in. Mr. Beckwith asked what duties the gas tester had performed for the last four months, during which he had received his salary from the corporation? He could not find that that gentleman had done anything. (Laughter.) Mr. Kitchen said they could not test meters until the test was agreed upon. Mr. Jeffery said, if the council would be patient, in a short time the matter would be brought before it in a shape which would be acceptable to all. The proceedings were then confirmed.

RATING OF WATER-MAINS.—The Southwark and Vauxhall, and the West Middlesex Water-Work Companies, by Mr. A. Shadwell, their solicitor, have recently appealed against their assessment in respect of their mains passing through the parish of Mortlake. Mr. W. T. Atwood, the vestry-clerk, with Mr. Samuels, the overseer, attended on behalf of the parish, and the assessment was agreed to be reduced by consent to £100 a mile. The like reduction of assessment by consent was also agreed, as from Midsummer, 1855, with respect to the mains of both companies passing through the parish of Richmond—Mr. H. Smith, the solicitor and vestry-clerk of the parish, reporting the vestry's approval thereof.

Price Current.

CASTINGS, per Ton.

Average Weight of Cast-Iron Gas-Pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lbs.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow	Newcastle.	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Pig Iron, No. 1	4 10 0	3 15 0	3 15 0	4 0 0	4 10 0
1½ and 2 inches Socket Pipes	8 0 0	7 5 0	7 10 0	7 15 0	7 10 0
2½ and 3 „ „ „	7 10 0	7 0 0	7 5 0	7 10 0	7 5 0
4 and 5 „ „ „	7 10 0	6 15 0	7 0 0	7 5 0	7 0 0
6 in. & upwards „ „	7 5 0	6 10 0	6 10 0	7 0 0	6 10 0
Retorts, 1st fusion, hot blast	7 0 0	...	7 0 0	7 5 0	7 0 0
„ 2nd „ cold „	8 0 0	...	7 5 0	7 10 0	7 5 0
Tank Plates, ⅜ thick and above	7 10 0	6 15 0	7 0 0	7 5 0	7 0 0

COALS.

NEWCASTLE.	s. d.		SCOTCH CANNEL.	per ton.
Unscreened.			Boghead, at Leith	32s. 0d.
Whitwell Primrose, Burnhope	7 0	per ton	Kirkness, best	23 0
Pelton and Medomsley	7 6	„	Capeldrae, 1st quality	20 0
Pelaw	7 9	„	„ 2nd „	12 6
Eighton Moor, New Pelton, Peareth, South Pelaw, Washington Hutton, & South Pearth	8 0	„	Lesmahago, at Glasgow	25 0
			„ „ Leith	27 6
			Arniston	22 0
			Wemyss	20 0
			Knightswood	18 0
Ramsay's Newcastle Cannel	15 0	„	Methill	18 0

SUNDRIES.

Best Newcastle fire-bricks	60s. per 1000	Welch bar iron, in London	£9 per ton.
„ „ „ clay	12s. per ton.	Foreign spelter	£30. 10s. „
Cliff's fire-bricks at Wortley	57s. 6d. p. 1000	English block tin	£146 „
Tough cake copper	£135 per ton.	Banca „ „	£150 „
English pig lead	£23 „	Tarred rope yarn	18s. per cwt.

WROUGHT-IRON TUBING, subject to 35 per cent. Discount.

	2 inches.	1½ inch.	1¼ inch.	1 inch.	¾ inch.	½ inch.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent welded tubes, from 2 to 12 feet, per foot	1 8	1 0	0 10	0 7	0 5	0 4½
„ „ „ 6 in. to 18 in., each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting pieces, or long screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, springs, and elbows—wrought iron	3 9	3 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, wrought or cast	4 6	3 0	2 6	2 0	1 6	1 2
Iron cocks	17 6	9 6	7 6	4 6	3 3	2 6
„ with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing sockets, caps, plugs, and nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 2 quart	15 0	14 0	13 6	13 0	12 0	

FREIGHTS, per Ton.

Coastwise—Newcastle.		*Foreign.*	
Chatham & Roches-	6s. 3d	Boulogne	8s. 9d
Cork [ter	10 6	Barcelona	28 0
Dover	6 6	Bordeaux	17 6
Dublin	11 0	Cadiz	18 0
Exeter Quay	9 0	Calais	8 6
Folkestone	6 6	Dieppe	10 0
Hastings	8 6	Genoa	30 0
London [mouth	6 0	Hamburg	11 0
Lowestoft & Yar-	4 9	Havre	10 0
Lynn	5 9	Leghorn	14 0
Portsmouth	8 0	Lisbon	18 0
Plymouth	9 0	Rotterdam	9 6
Whitstable	6 6	Stettin	12 0
Weymouth	8 6	Trieste & Venice	35 0

Advertisements.

RETORT AND BOILER SETTING.

FREDERICK SIMMONDS, Sen.,

No. 19, YORK STREET NORTH, HACKNEY ROAD.

Thirty years RETORT SETTER to some of the leading London and Provincia lGas Companies, to whom he can refer, begs leave to draw attention to his economical mode of Setting Clay or Iron Retorts, &c.

F. S. will engage to provide all materials and labour, or labour only.

TO GAS COMPANIES, FITTERS, AND IRONMONGERS.

LLOYD and SUMMERFIELD,

Manufacturers of CUT and FLINT GLASS Jet Moons, Globes, Hemispheres, and Chimneys of every description; Hall Lamps, Lustres, and Chandeliers of the most modern patterns.

PARK GLASS WORKS, BIRMINGHAM.

JAMES NEWTON,

FIRE-BRICK AND TILE MERCHANT,

Wholesale and for Exportation,

FALCON DOCK, 78 AND 79, BANKSIDE,

SOUTHWARK, LONDON.

DEPÔT for STOURBRIDGE AND NEWCASTLE FIRE-BRICKS, LUMPS, TILES, and CLAY, and every Article suitable for

GAS AND WATER WORKS.

EDWARD RUSSELL,

ALMA TUBE WORKS,

WALSALL.

Manufacturer of Patent Welded Wrought-Iron Tube for Gas, Steam, and Water. Wrought and Cast Iron Fittings of every description. Stocks, Taps, and Dies. Core Bars for Ironfounders.

CAST-IRON TANK AND GASHOLDER FOR SALE,

AS they now stand, at the Hastings' GAS-WORKS. The Tank is 37 feet diameter, and the Gasholder 36 feet; both 18 feet deep, with Guides complete; made and erected by Messrs. Losh, Wilson, and Bell in 1842, and in excellent condition.

Proposals to be addressed to Mr. W. GINNER, HASTINGS.

TO GAS COMPANIES.

WANTED by the Advertiser, who is fully competent to the undertaking, the MANAGEMENT of a small country gas-work. He can have a fourteen years' character for ability and integrity from his late employer. Testimonials and reference on application to G. G., care of Mr. W. B. KING, publisher of this JOURNAL, 11, Bolt Court, Fleet Street, LONDON (E. C.).

TO GASFITTERS.

WANTED, a Steady, Active Man, as GAS-FITTER and SERVICE-LAYER. He must be thoroughly competent to Repair Meters of different Makers. Wages, 25s. per week.

Apply, in own handwriting, enclosing Testimonials, to EDGAR CHURCH, Gas-Works, BURY ST. EDMUND'S.

BRYAN DONKIN and CO.'s improved GAS VALVES have been adopted by numerous Gas Companies in England and abroad, and their advantages and great security fully proved. Very large numbers are in use. Prices from 11s. to 14s. per inch diameter.

BRYAN DONKIN and Co.,

Engineers, near Grange-road, BERMONDSEY.

FOR SALE—GASHOLDERS & TANKS.

Four strong Cast-iron GAS-TANKS and HOLDERS, 34 feet by 20 feet, complete, in good working order; are now in use. For further particulars, apply to

GARRETT & CROSS,

MEDWAY IRON WORKS,

MAIDSTONE,

Manufacturers of Gas-Tanks, Holders, and all Apparatus, Steam-Engines, and Machinery, requisite for Gas or Water Works. Columns, Girders, and every description of Castings to Drawing or Model. Also particularly invite attention to their PORTABLE GAS APPARATUS, for isolated districts: prices varying from £25 to £150.

References given on application at GARRETT and CROSS, Medway Iron-Works, Maidstone, KENT.

TO GAS COMPANIES, ENGINEERS, AND MERCHANTS.

EDWIN DIXON,

WROUGHT-IRON TUBE WORKS,

WOLVERHAMPTON,

begs with the utmost confidence to solicit the order of Gas Companies, and persons using or selling Gas Tubes. Having for a long period supplied the largest Gas Companies and Consumers in the United Kingdom and the Continent with unvarying approbation, and almost exclusively the Local Boards of Health under Government Engineers, with Galvanised Iron Tubes and Connections, it has become an inducement to make such facts known.

Large Stock always being on hand, orders of any magnitude, from 10 to 100,000 feet, are executed promptly, and carefully tested by powerful hydraulic pressure before leaving the Works.

Boiler Tubes, Core Bars, Hollow Spindles, and Hydraulic Press Pipes, to resist 5000 lb. to the square inch, made on the shortest notice.

N.B.—Mr. Edwin Dixon had the honour of receiving the only Prize Medal of the Great English Exhibition, 1851, awarded to this manufacture.

PADDON AND FORD,

PATENT GAS METER & APPARATUS WORKS, GRAY'S-INN-ROAD, LONDON,

Manufacturers of WET and DRY GAS METERS, STATION METERS, GOVERNORS, EXPERIMENTAL APPARATUS, GAS STOVES, and LANTERNS.

Contractors for the erection or alteration of Gas Works; and every description of Apparatus required in Gas Works supplied.

M. SHEEN, Gas and Railway

Lantern Maker, 90½, Holborn Hill, begs to inform Managers of Gas-Works, &c., that she continues to contract and supply Lanterns on reasonable terms, and keep them in repair by the year.

ADDISON POTTER,

WILLINGTON QUAY,

NEAR NEWCASTLE-UPON-TYNE,

Manufacturer of Clay Retorts, Fire Bricks, and every description of Fire Clay Goods.

WHITEHOUSE and CO.,

GLOBE PATENT TUBE WORKS,

WEDNESBURY,

Beg to draw the attention of Engineers and Managers of Gas Works to the superior quality of the Article they manufacture, both in respect of the iron employed, and the perfect manner in which it is welded; in proof of which they can refer to the testimonials of the most eminent Gas Engineers, and the experience of the principal of the large Gas Companies of the kingdom.

Orders promptly executed.

ALFRED PENNY,

ENGINEER,

WENLOCK IRON WORKS,

WHARF ROAD, CITY ROAD, LONDON.

Mr. PENNY begs to inform Gas and Water Companies that he undertakes the erection of new, or the alteration of existing, works; and that he may be consulted generally on all matters connected with gas and water supply. He is also prepared to supply best Cold-blast Retorts, Socket-Pipes, and Connections, Iron Borings, &c. &c., and all the necessary Castings used in Gas and Water-Works.

*** Country orders executed with care and despatch.

EIGHTON MOOR GAS COALS.—

Parties wishing to be supplied with these first-class Gas Coals will please to apply to Mr. MATTHEW NESBIT, EIGHTON MOOR OFFICE, NEWCASTLE-UPON-TYNE. These coals are well known as among the richest in gas, and working the roundest on the River Tyne. They are extensively used by metropolitan gas works.

FIRST PRIZE IN THE PARIS EXHIBITION.

GAS EXPLOSIONS PREVENTED

by using the Tubes and Fittings Manufactured by

JOHN RUSSELL and CO.,

whose Goods are all well Tested and Warranted.

Inventors and first manufacturers of Lap-welded Flues for Locomotive and Marine Boilers.

John Russell and Co. are the Original Manufacturers, and at present the Holders, of the Patent for Tubes.

WAREHOUSES,

69, UPPER THAMES STREET, LONDON.

MANUFACTORY,

THE OLD TUBE WORKS, CHURCH HILL,

WEDNESBURY, STAFFORDSHIRE.

PATENT FLEXIBLE GAS TUBING.

JAMES LYNE HANCOCK'S

Vulcanized Indiarubber Hose Pipes and Tubing. Manufactory (and Warehouse), Goswell-mews, Goswell-road, London.

Gas Companies, Engineers, Gas Fitters, and the Trade generally, are respectfully informed this Tubing is now manufactured to any size, from ¼ inch bore and upwards, in 100-feet lengths, and perfectly cylindrical, either with or without a spiral wire inside.

VULCANIZED GLAZED FLEXIBLE TUBING, from ¼ inch up to 1 inch diameter, made in 24-feet lengths; or, covered with silk or worsted, up to 100 feet.

VULCANIZED HOSE, for FIRE ENGINES, BREWERS' USE, and for standing great pressures, (Rubber and Cloth combined), made to any length or size to fit the necessary screws, &c.

VULCANIZED INDIARUBBER AIR-TIGHT BAGS, made any size, for Gas Mains, with flexible tubes attached, and fitted with stopecocks complete.

WALTER MABON, Engineer,

ARDWICK IRON WORKS, FAIRFIELD STREET,

MANCHESTER,

Manufacturer of

IRON TANKS for Gasholders, Railway Stations, &c.

GASHOLDERS.—Extensive premises at Gorton, solely for the manufacture of Gasholders, and other heavy Wrought-Iron Structures.

GAS APPARATUS.—W. M. has an extensive assortment of patterns for Purifiers from 4 feet to 15 feet square, also round ones from 4 feet to 10 feet diameter; Scrubbers, Condensers, Washers, Columns, Girders, and Tripod Patterns, suitable for Gasholders, from 10 feet to 150 feet diameter, either Single-lift or Telescope. Contractor for Gas Works of any Magnitude. Designs, Specifications, and Estimates furnished.

WROUGHT and CAST IRON ROOFS for Railway Stations, Gas Works, Warehouses, and Sheds, prepared for Slates or for Corrugated Iron.

IRON HOUSES, either for Dwellings, Manufactories, or Public Buildings.

PIPES and VALVES, for Gas and Water, from 2 inches to 48 inches bore.

WILLIAM PARKINSON AND CO.,

(Successors to the late Samuel Crosley),

COTTAGE LANE, CITY ROAD, LONDON,

Beg to announce that, in addition to the manufacture of GAS-METERS, they continue the manufacture of METERS for MEASURING WATER, SPIRITS, &c., commenced, under Patent in 1849, by the late Mr. William Parkinson.

These Meters are as simple and durable as the Gas-Meter, and as correct as that instrument in the registration of the fluids passing through them.

By Her Majesty's Royal Letters Patent.

JOSEPH BOULTON,

PATENT DRY GAS-METER MANUFACTURER, and also Maker of his Improved WATER METERS.

No. 28, BAGNIGGE-WELLS-ROAD, CLERKENWELL, adjoining the Police Office.—Late of No. 1, Coppice-row, LONDON.

Experimental and Station Meters of any size made to order on the shortest notice.—Governors, Pressure Registers, Gas-cooking Stoves, and every description of Gas Apparatus.

GEORGE CUTLER,

GASHOLDER MAKER,

No. 8, WENLOCK-ROAD, CITY-ROAD,

LONDON.

Contracts for Tanks, Gasholders, Roofs, Purifiers, and all descriptions of Gas Apparatus executed on the most reasonable terms. Improved Slide Valves, Steam, and Range Boilers, and Smiths' Work, of the best materials and workmanship.

ROBERT MACLAREN,

(Successor to Andrew Liddle and Co.,)

IRONFOUNDER AND GAS ENGINEER.

Manufacturer of Patent Iron Tubing, Block Tin, Lead, and Composition Tubing. Cast-iron Gas and Water Pipes of all sizes, and every description of Gas Apparatus.

GLOBE FOUNDRY, GLASGOW.

H. JONES, Gas Meter Manufacturer,

No. 44, OLD-STREET, St. Luke's, London, begs respectfully to call the attention of Gas Companies to his latest improvements in the WET METER, by means of which water cannot be abstracted, neither can Gas by any possibility pass through the Meter without registering.

WHITWELL PRIMROSE GAS

COAL.—These excellent Gas Coals can be shipped either at the South Dock, SUNDERLAND; or Old Harbour, HARTLEPOOL; or Brandling Drops, SOUTH SHIELDS; on application to the WHITWELL COAL COMPANY, Sunderland.

ARTIFICIAL Hydraulic or Portland

CEMENT, for Brickwork, Concrete, Plastering, &c., combines the valuable qualities of the natural Cements, with the additional advantage that it greatly excels them in its cementitious properties; that it is not affected by frost, and does not vegetate in damp situations. Account of COMPARATIVE EXPERIMENTS on the strength of this and other Cements (read at the Institute of Civil Engineers) to be obtained from the Makers, JOHN BAZLEY WHITE and BROTHERS, Millbank Street, WESTMINSTER, who prepare one quality only of Portland Cement.

NOTICE.—INFRINGEMENT OF PATENT.

CRICKMER'S Patent Metallic Pack-

ING for Steam-Engines, Pistons, Piston-Rod Stuffing-Boxes, Pumps, &c.—Notice is hereby given that a perpetual Injunction of the High Court of Chancery has been obtained by Messrs. OASTLER and PALMER, trading under the Firm of ALEX. ROSS and CO., Grange Mills, Bermondsey, against Messrs. LITTLE and CHAMBERS, of Manchester, to restrain them from further infringing the above Patent; and that the above Packing can only be obtained of Messrs. ALEX. ROSS and CO., Grange Mills, Bermondsey, LONDON (the Proprietors of the Patent), or by their authorised Agents.

MILL BANDS, HOSE PIPES, & FIRE BUCKETS made to order from the best-selected Oak-Bark Tanned Leather.

Prices Current to be had on application.

NOTICE.—Mr. N. DEFRIES, Consult-

ING GAS ENGINEER, begs to inform gas companies and the public, that he is desirous of meeting any gentlemen at his WORKS, NEW ROAD, ST. PANCRAS, where, under his own superindence of the manufacturing department, they will have the fullest opportunity of investigating the many improvements he has recently effected in his ROTARY-VALVE DRY GAS-METER, by which full security will be afforded against leakage and non-registration, even against the searching effects of Cannel Coal Gas. The Rotary-Valve Meter is warranted to register inflexibly correct at a working pressure of half a tenth, and less than a quarter of a foot per hour upon a blue light; and a guarantee will be given to all gas companies to keep it in repair for not less than five years, free of expense. With this meter the gas-supplier may fully depend upon a fair return, and the public upon having a just measurer.

GAS BATHS, GAS COOKING and HEATING STOVES, for all classes. The British Polytechnic Gas-fire, &c. Conservatories and Buildings heated by gas, and perfect ventilation secured.

Any gentleman desirous of consulting Mr. Defries in especial cases, may meet him either at his office, 145, REGENT STREET, or at his residence, 5, FITZROY SQUARE, by giving one day's notice.

Gas-works erected for private houses, where no gas company exists.

MR. HENRY GORE,

CIVIL AND CONSULTING GAS ENGINEER.

OFFICE,

25, YORK PLACE, LEEDS.

NOW READY,

VOL. V. of the JOURNAL of GAS

LIGHTING, WATER SUPPLY, and SANITARY IMPROVEMENT, for 1856, price 21s., bound in cloth and lettered. A few copies of Vols. II., III., and IV. are still on sale.

W. B. KING, 11, Bolt Court, Fleet Street.

JAMES FEATHERSTONE,

ENGINEER,

Manufacturer of GASHOLDERS, IRON ROOFS, and every description of Gas Apparatus.

ALLIANCE IRON WORKS,

CLAYTON, near MANCHESTER.

JOHN BENT,

MANUFACTURER OF GAS METERS,

283, BELL BAND ROAD,

BIRMINGHAM,

(Established 1830),

Begs respectfully to call the attention of Gas Companies, Engineers, &c., to his WET GAS METER, made upon the most improved principles, the most admirable materials, and warranted to register correctly.

BIRTLEY IRON WORKS

CHESTER-LE-STREET,

DURHAM.

Manufactory for every description of Casting and Machinery for Gas Works and Water Works.

Warehouse in London for Cast-iron Pipes and Connections of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.

Office in London, Mr. E. M. PERKINS, 78, Lombard Street.

JAMES PINCHBECK,

GAS METER MANUFACTURER,

26, CAMDEN-STREET, and 9, PIERREPOINT-ROW,

ISLINGTON, LONDON.

Begs respectfully to announce to Gas Companies and Fitters, that from upwards of 20 years' practical experience, he is enabled to supply a METER combining correctness, durability, and economy.

N.B.—Repairs on the lowest scale.

PATENT GAS METER MANUFACTORY,

No. 66, Snow-hill, London.

WILLIAM SMITH, by the

improvements he has made in the Wet Meter, and which he has secured by her Majesty's Royal Letters Patent, the accuracy of their registry is rendered certain by the introduction of the adjusting slide and hydraulic, whereby a Perfect Water Level is readily obtained, and the Hydraulic precludes the possibility of abstracting water from the meter by increased pressure or otherwise, thus surmounting the great desideratum of the Wet Meter. In his Patent Equitable Gas Meter neatness and strength are combined, the backs and fronts of the case being stamped by powerful machinery out of thick plate iron (tinned or galvanized); and the internal construction is of the best metal, which will resist the action of any impurity in the gas.

Old Meters may readily have the adjusting slide and hydraulic applied, thereby having accurate measurement assured.

Station Meters, Governors, &c., made on the shortest notice.

J. JONES, Iron Merchant, 6, Bank-

SIDE, has long been known to sell the following Castings at prices lower than any other house in London:—Socket and Flange Pipes, Bends, Branches and Tees, Syphons, Lamp-posts, Rain-water Pipes, &c.; also, Hot Water Pipes, Elbows, Tees, Cylindrical and Saddle Boilers, and every Fitting for the same. Drawings and Prices of the above on application to J. JONES, Iron Bridge Wharf, 6, BANKSIDE, near the Southwark Iron Bridge.

WEST and GREGSON,

GAS-METER MANUFACTURERS, &c.

UNION-STREET, OLDHAM.

Station and Experimental Meters, Gas Pressure Registers, Gauges, Experimental Gasholders, Governors, Slide Valves, &c. &c.

W. and G. would respectfully call the attention of Gas Engineers and Managers to their Station-meters, having made and erected the largest in use at the present time, two of which may be seen at the Stockport and Liverpool Gas Works, on application to the respective Engineers.

BRYAN, M'CRACKEN AND CO.,

3, INDIAN KING'S COURT,

NEWCASTLE-ON-TYNE.

Contracts made for all kinds of Cast and Wrought Iron Gas and Water Apparatus, Clay Retorts, Fire-Bricks, Coals, &c.—Prices, and Lists of Freights and Carriage sent on application.

ALEXANDER WRIGHT,

GAS ENGINEER, MANUFACTURER OF GAS-METERS, GOVERNORS, AND EVERY DESCRIPTION OF GAS APPARATUS,
55, MILLBANK STREET, WESTMINSTER.
CONSUMERS' METERS at the List Price, with a Liberal Discount to Wholesale Purchasers.
THOMPSON'S BROMINE TEST, £1. 1s.—BROMINE, 3s. per Ounce.
BISULPHURET OF CARBON TEST, £2. 2s.
APPARATUS FOR DETERMINING THE HEATING POWER OF SAMPLES OF COAL AND OTHER DESCRIPTIONS OF FUEL, £5. 5s.,
INVENTED BY LEWIS THOMPSON, ESQ., M.R.C.S.
REGISTERING PRESSURE GAUGE, Net Price, £8. Glass Shade, 10s. extra.
STATION METERS, PRESSURE GAUGES, PHOTOMETERS, SPECIFIC GRAVITY APPARATUS, &c.

FIRE-CLAY RETORTS.

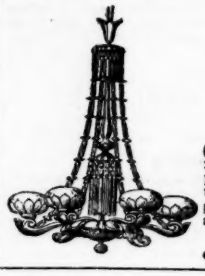
JOHN SWARBRICK,

MANUFACTURER OF PATENT COMPOSITION CLAY RETORTS,
FIRE BRICKS OF EVERY DESCRIPTION, SHAPE, AND SIZE, &c. &c.
HIGHER EANAM, BLACKBURN, LANCASHIRE.

These RETORTS are generally used in the Gas-works of Preston, Accrington, Bury, Heywood, Middleton, Rochdale, Ratcliffe; the Mills of Messrs. Horrocks, Miller, and Co., Preston, &c. &c., and are unequalled in having afforded general satisfaction to those who have given these Retorts a trial.
To meet the increasing demand, the Works at Little Harwood have been greatly enlarged; and Gas Engineers who may favour with an Order may rely with confidence on their being promptly supplied with an article not to be surpassed in finish or durability.

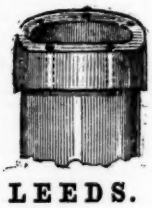
PRICES MODERATE.

JAMES OAKES and CO.,
ALFRETON IRON WORKS, DERBYSHIRE,
AND
WENLOCK IRON WHARF, 20, WHARF ROAD, CITY ROAD, LONDON,
Beg to inform Gas and Water Companies and the public, that they keep in stock in London all the CASTINGS in general use in Gas and Water Works, including best cold-blast Iron Retorts, Socket and Flange Pipes of all sizes, Bends, Branches, Syphons, Lamp Columns of various patterns, &c.
N.B.—Orders for Cast-iron Tanks, Girders, Columns, Cylinders, and all irregular castings, will have immediate attention.
CHARLES HORSLEY, Agent.
C. H. is prepared to carry out the warming and ventilation of public buildings, &c.; also civil engineering in general.



F. & C. OSLER,
44, OXFORD STREET, LONDON;
Manufactory—Broad-street, Birmingham,
MANUFACTURERS OF GLASS CHANDELIERS, GLASS LUSTRES, TABLE GLASS, &c. &c.
ELEGANT CRYSTAL GLASS CHANDELIERS, FOR GAS
(Made from "REGISTERED" DESIGNS), with GLASS BRANCHES, &c.; suitable for DRAWING-ROOMS and BALL-ROOMS. The more extensive use of GAS in private dwellings has induced Messrs. OSLER to direct their particular attention to the manufacture of this class of articles—which, with a view to their general adoption, are offered at very moderate prices. Purchasers can select from a great variety of patterns, to which additions are being constantly made.
THEATRES, CONCERT, ASSEMBLY, AND BALL ROOMS LIGHTED BY ESTIMATE ON THE LOWEST TERMS.

FIRE-CLAY GAS RETORTS.



ESTABLISHED IN 1795.

JOSEPH CLIFF,

WORTLEY FIRE-BRICK WORKS, near LEEDS.

THESE RETORTS are unrivalled in excellence, being the BEST FINISHED INTERNALLY, and THE MOST CORRECT IN FORM, of any in the Kingdom. From the peculiar composition used in working up the face of the material, they are rendered unusually smooth, close, and FREE FROM SURFACE CRACKS, thus, in a great measure, preventing leakage and the adhesion of carbon to their interior surface.
To meet the yearly increasing demand of UPWARDS OF THIRTY SEASONS and to carry out the late improvements in the manufacture, the Premises have been re-erected and much enlarged, and Engineers may rely WITH CONFIDENCE on their orders being completed with a greater regard to despatch than by any other House.

THE WORKS ARE WELL SITUATED

For EXPORT from the Ports of { **LONDON, LIVERPOOL, HULL, MIDDLESBRO', HARTLEPOOL, and STOCKTON.**

FIRE-BRICKS, LUMPS, GUARDS, TILES, AND CLAY, of the same quality.

M. B. NEWTON, London Agent, No. 4 Wharf, King's Cross Goods' Station.

HULETT AND CO., 55 AND 56, HIGH HOLBORN,

PATENTEES and MANUFACTURERS of the NATIONAL GAS METER,

Beg to inform the Proprietors of Gas Companies, and the Trade generally, that, having completed their new Gas-Meter Manufactory, they are now enabled to supply, with despatch, a very superior article, and can confidently warrant the same to be equal in quality and workmanship to any Gas-Meter ever made. Manufacturers of

GAS CHANDELIERS, GLASS LUSTRES, HALL LANTERNS, PILLARS, BRACKETS, PENDANTS,
AND EVERY ARTICLE CONNECTED WITH
GAS FITTINGS.
GAS COOKING APPARATUS, IMPROVED ALBERT,
AND EVERY DESCRIPTION OF
SHADOWLESS GAS BURNERS, UNION JETS, BATSWINGS, &c. &c.; CAST AND WROUGHT IRON PIPE; COPPER, TIN, BRASS, and COMPOSITION TUBING.

D. HULETT'S IMPROVED SERVICE CLEANSER,
by which Mains, Service Pipes, and the interior Fittings of a House, may be cleaned out in a few minutes. Price 60s. net.
Sole Manufacturers of Church and Mann's Improved Photometer.

Large Pattern Books, with every description of Gas Fittings and Chandeliers, &c., with complete Book of Prices, price 10s.
Price Lists sent free, on receipt of envelope, addressed, and enclosing two postage stamps.

London: Printed by THOMAS GREAVES BARLOW, of 3, Parliament Street, in the parish of St. Margaret, Westminster (at the office of Joseph Clayton, 10, Crane Court, Fleet Street); and published by WILLIAM BOUGHTON KING, of No. 11, Bolt Court, Fleet Street, in the City of London.—Tuesday, Feb. 17, 1857.